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NOTES ON THE ALKALOIDS OF COCA LEAVES.

By A. B. Lyons, M.D.

A year ago there were probably not a dozen places in the United States where cocaine could have been bought, and, except in an experimental way, not a grain of the alkaloid had been manufactured in this country. To-day there is not a second-rate drug store in any one of our cities which does not keep on hand a small supply of the article, and manufacturers have been obliged again and again to increase their capacity to produce it, so active has been the demand.

As long as the alkaloid was only to be found in collections of rare chemicals, or as an item in the long list of articles which for the sake of completeness the largest dealers in chemical specialties were obliged to have in stock, no especial interest attached to this particular alkaloid, and accordingly we find most of the text-books entirely silent with regard to its properties; many of them do not even mention its existence.

Now that it has come into every day use, however, it is important that its chemical reactions should be as well known as those of quinine or caffeine, since it is now liable to come under observation in medico-legal investigations. It is also desirable that the physical properties of the cocaine salts should be familiar, so that purchasers may be on their guard against substitutions or adulterations.

There is yet much to be learned in regard to the alkaloids of coca leaves. It is not improbable that there may be several distinct alkaloids which have not yet been described. It is very certain that much of the cocaine in the market is a mixture of several apparently distinct substances, but cocaine is itself so unstable a compound that it is not easy in the present state of our knowledge to affirm that some of these substances are not allotropic modifications of cocaine itself.

Coca leaves when they reach this country contain, so far as assays have yet been able to show, not more than 0·8 per cent. of cocaine.

The writer has examined leaves which yielded no more than 0·15 per cent., and of this scarcely any was capable of forming crystallizable salts. Freshly imported leaves of a recent crop contain generally 0·65 to 0·8 per cent. of extractible alkaloid, but of this not more than one-half generally consists of crystallizable alkaloid. In manufacturing operations the yield of alkaloid is much below what assays show to be present. It is doubtful indeed whether any method of assay yet devised extracts nearly all the alkaloid. A good sample of coca leaves yields a tincture which when titrated with Mayer's reagent gives an apparent alkaloidal strength much higher than the assay indicates, but it is altogether possible that the precipitate consists in part of compounds not alkaloidal.

The assay process adopted by the writer has been recently described in detail;[1] it consists in treating the leaves, in fine powder, with about eight times their weight of a mixture of stronger ether 95 volumes, spirit of ammonia 5 volumes, and washing out the alkaloid after 24 hours' maceration from an aliquot portion of the solution, first into acidulated water, then from alkaline solution into ether, evaporating and weighing. Some assays have been reported from Bolivia which seem to show that the leaves when freshly gathered contain a much larger proportion of alkaloid than after transportation to this country. This confirms the statement that has been often made, that in Peru and Bolivia coca leaves are believed to deteriorate very rapidly, so that when more than six months old they are not considered fit for use. It is even stated that the coca chewers find that the leaves when they arrive at the coast, in the usual mode of transportation, are less active than at the beginning of their journey. In a climate as damp as that of the coca-producing regions it is probably next to impossible to dry the leaves properly before packing, and it is easy to understand how under these conditions they suffer even from so short a journey.

Some packages of coca shipped from Lima apparently in good condition, at the end of their voyage were found by the writer much heated—temperature in the centre of the package 110°F.—and evidently greatly deteriorated. These leaves contained nearly 18 per cent. of moisture; had they been really dry, *i. e.*, so as to contain 10 per cent. or less of moisture, they would probably have lost nothing in the transportation.

[1] "Chicago Pharmacist," September, 1885.

The alkaloid obtained from leaves that have deteriorated is always more or less dark colored, and contains a small proportion only that is capable of taking on the crystalline form. From good leaves the alkaloid obtained in assays is nearly or quite colorless, and is left in the form of a crystalline mass on evaporation at a low temperature of the ether.

Crude cocaine has a characteristic tobacco-like odor, which suggests the idea that some portions of the product have become split up so as to reveal the pyridine constituent of the base. This odor, however, does not disappear when the alkaloid is neutralized. Solutions of the crude product in alcohol have generally a brownish color, which is deep in proportion to the amount of impurity present. From hot alcoholic solutions, 1:1, a large portion of the alkaloid separates on cooling in the form of distinct prismatic crystals. The mother-liquor by spontaneous evaporation yields another crop of less perfect crystals, which may, however, be obtained by repeated recrystallization nearly or quite colorless. After the cocaine has all crystallized out there remains a dark-colored syrupy liquid, which consists partly of alkaloid apparently identical in chemical and physiological characters with cocaine, but which does not itself crystallize, and does not form crystallizable salts. For this uncrystallizable alkaloid the names cocaicine and cocainoidine have been proposed. It appears to bear to cocaine a relation similar to that of chinoidin to quinine, or of invert sugar to sucrose, but no ultimate analysis has as yet been made of it, and our knowledge of it is very incomplete.

Besides this there is often present a feebly basic, extremely bitter substance, which possibly may be ecgonine, of which accounts accessible to me are very meagre. The malodorous constituent already mentioned seems not to have the character of an alkaloid, for its odor remains unchanged after neutralization with an acid. It is easily separated from the crystallizable alkaloid by repeated crystallizations, and this appears to be the only way of obtaining a pure product.

Pure cocaine should exhibit the following characters: colorless distinct crystals (Fig. 1), or a crystalline white powder, without odor, at first seeming to be tasteless, but as it dissolves developing a slightly bitter taste, and producing numbness of the tongue; wholly soluble in ether, soluble also in alcohol, chloroform, benzol, petroleum ether, bisulphide of carbon, in "petrolina" oil and melted petrolatum, and

in the fixed and volatile oils; nearly insoluble in water.[1] It combines with acids, completely neutralizing them and forming salts which are generally easily crystallizable.

The salt of cocaine most employed is the hydrochlorate. Although crystallizing easily, it is often offered in the form of an amorphous powder, and such a product is not of necessity impure. The salt, however, should be nearly white, and wholly free from odor, and should show no disposition to absorb moisture from the air. The microscopic appearance of the crystallized pure salt is shown in Fig. 3, B, drawn from nature. It should dissolve easily and completely in water, yielding a colorless solution, neutral or very faintly acid to litmus paper, and having a saline, not a strongly bitter taste. A solution containing one grain to the fluidounce will produce a sensation of numbness in the mouth and throat if a few drops of it are swallowed. When treated with Froehde's reagent (sulphomolybdic acid) the salt

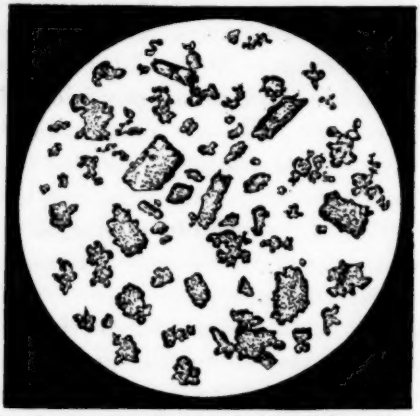

FIG. 1.—Cocaine alkaloid, commercial product crystallized from alcohol. X 50 diameters.

should produce no immediate coloration; impure products generally give a reddish brown color, more or less rapidly fading. In a few cases a green color has been observed to develop subsequently.

The salt dissolves in less than its own weight of water. It is also freely soluble in alcohol, less readily in absolute alcohol and in chloroform, and is practically insoluble in ether, in petroleum ether and in

[1] Authorities state that cocaine requires for solution 704 parts of water. The crystallized alkaloid is much less soluble than this, since it crystallizes from a solution containing 1:1,500. It would probably require of cold water for solution not less than 2,000 times its weight.

fixed and volatile oils. The aqueous solutions yield by spontaneous evaporation acicular crystals, which after drying over sulphuric acid seem to be anhydrous. Crystals obtained from alcoholic solutions are certainly anhydrous. Their form is that of rhombic plates, but the crystals are generally very imperfectly formed. (Fig. 2.)

FIG. 2.—Cocaine muriate. Crystals obtained by spontaneous evaporation of a drop of saturated aqueous solution. X 100 diameters.

Cocaine hydrobromate is a salt less employed than the hydrochlorate, but deserving to be better known. It crystallizes readily from aqueous solutions in slender transparent prisms (Fig. 4), which are permanent in the air. They contain two molecules (8·57 per cent.) of water of crystallization. The purity of the salt is at once manifest in its crystalline appearance, and there is no reason why it should not always be offered in the form of distinct crystals. It contains of course a smaller proportion of cocaine than the muriate (72·2 per cent. in the former, 89·25 per cent. in the latter), so that to produce the same effect a larger quantity will be required.

Cocaine citrate has been employed to a limited extent in dentistry, but has no points of superiority over the muriate. It does not easily assume the crystalline form, and owing to its hygroscopic nature it is very troublesome to dispense. It can be formed into pellets for dentists' use without the addition of any excipient; but by the use of a small amount of excipient the hydrochlorate can be made easily to answer the same purpose.

Cocaine combines with oleic acid to form a readily crystallizable salt, which is much employed in the form of a solution in excess of oleic acid or in any bland oil. Where an oil is used it will be found necessary to employ in connection with it a certain proportion of oleic acid, or crystals of the cocaine oleate will separate from the solution in cold weather.

A more desirable preparation, perhaps, is a solution in a pure mineral oil of the alkaloid itself, and although there still exists a prejudice in the minds of some physicians against the use of mineral oils in liniments, ointments, etc., experience seems to show that this preparation at least is as active as a solution of the oleate of the same strength in oleic acid or in a vegetable oil.

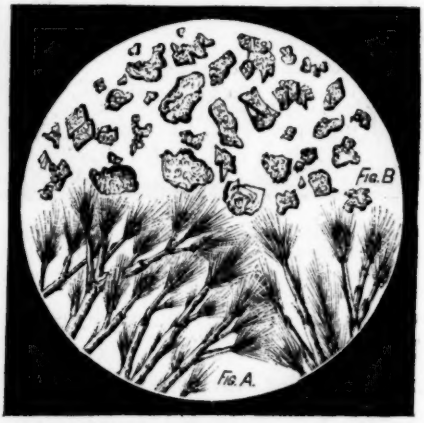

FIG. 3 *A.*—Cocaine alkaloid, crystals formed by adding ammonia to aqueous solution, 1 : 1000, of cocaine muriate. X 75 diameters.
B. Cocaine muriate crystals, commercial. X 50 diameters.

Cocaine combines with boric acid to form a crystallizable salt rather sparingly soluble in water, which contains no more than 55 per cent. of the alkaloid, one molecule of base requiring apparently four of boric acid for neutralization.

There seems to be no reason why this salt should be used in preference to the hydrochlorate or hydrobromate, and in fact it is little employed.

With sulphuric acid cocaine forms a salt which crystallizes easily in short six-sided prisms; of the remaining salts the oxalate may be mentioned as one which crystallizes easily, and which may be obtained

from an ethereal solution of the alkaloid by the addition of an ethereal solution of oxalic acid.

The behavior of the salts of cocaine to reagents presents little that is distinctive. So far as my experiments have extended, it does not give any color reactions of any importance. Its most characteristic peculiarity is the facility with which its molecule is split up, with formation of benzoic acid. If treated with an alcoholic solution of sodium or potassium hydrate, the alkaloid is very rapidly destroyed, and benzoic ether, recognized by its odor, is immediately formed. After a short time the solution is found to contain abundance of benzoic acid, but hardly a trace of alkaloid. If ecgonine is formed in the first stage of the reaction it must be afterwards in turn destroyed,

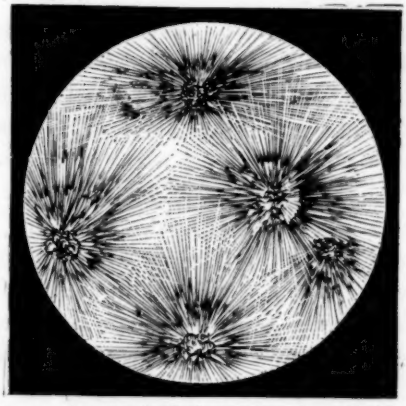

FIG. 4.—Cocaine hydrobromate. Crystals formed by spontaneous evaporation of aqueous solution. X 50 diameters.

or else its reactions are not those of an ordinary alkaloid. Lime and ammonia act more slowly, but both gradually effect a similar result. This action of alkalies was recently pointed out by H. MacLagan ("American Druggist," February, 1885). It had previously been well known that cocaine is split by the action of strong hydrochloric acid into benzoic acid, ecgonine and methylic alcohol by a reaction which Lössen formulates thus:

$$C_{17}H_{21}NO_4+2H_2O=C_7H_6O_2+C_9H_{15}NO_3+CH_4O.$$

G. Calmels and E. Gussin have recently showed that baryta effects the same decomposition when heated for some time at 120°C. in a sealed tube with a solution of cocaine hydrochlorate. According to

these authorities, ecgonine has the characters rather of an acid than of an alkaloid. It is neutral in reaction and combines with alkalies to form compounds which have a faintly alkaline reaction and are very soluble in water and in alcohol. It forms, however, double salts with platinum and gold chlorides, but, unlike those of most alkaloids, these are readily soluble in water. By destructive distillation of the barium compound of ecgonine these authors obtained an isotropine, C_8H_{15},NO, which they regard as methoxyethyltetrahydropyridine, ecgonine being methoxyethyltetrahydropyridine-carboxylic acid, while cocaine is methylbenzo-methoxyethyl-tetrahydropyridine-carboxylate, an extremely plausible and lucid view, no doubt, but one which we must be content to leave to the theorists to discuss.

For the identification of cocaine the organoleptic properties of the alkaloid are of the first importance. The benumbing effect upon the tongue is unlike that of any other substance, and is produced by a very minute quantity of the substance. The effect on the mucous membrane of the eye is equally striking. One drop of a 4 per cent. solution will blanch the entire conjunctiva, an effect which is most strikingly manifested on the vascular inner surface of the lids. The anæsthetic effect is also very noticeable, even from this small quantity of the agent, and may be fully developed by repeating the application two or three times at intervals of two minutes. More or less dilatation of the pupil generally follows such an application, but this does not appear to be a constant effect. It is questioned by some, indeed, whether cocaine itself dilates the pupil at all, this effect being attributed to hygrine, or some other accompanying alkaloid. I am inclined to think the effect is really produced by cocaine; at least I have not succeeded in producing a salt which does not exhibit this action. It is certainly safe to say that it is not due to contamination with hygrine, which could not be present in the purified product.

Reactions of the various impurities liable to occur in cocaine have not as yet been sufficiently studied. One curious one I may mention, although the explanation of it is not yet found. This is the development of an intense green color by the action of acids. When the impure alkaloid is treated with hydrochloric acid to produce a salt the solution assumes this color as long as the acid remains in excess. As the solution becomes neutral the green color fades, passing finally to a brownish shade, with separation of a flocculent brown precipitate. The color suggests the idea that there may be present some chlorophyll

derivative. Other acids besides the hydrochloric develop it under similar conditions.

The behavior of solutions of pure cocaine muriate with the common reagents has been studied by the writer with the following results:

Mayer's reagent is capable of detecting very minute quantities of the alkaloid. A single drop of a solution containing one part of the salt in 12,500 parts of water yields with this reagent a distinct precipitate. A faint cloud is produced in a solution, 1:100,000; in one of half this strength it is barely discernible, a single drop of the solution placed on a mirror being employed in this as in the other tests mentioned.

In solutions containing one part of alkaloid in 500, one Cc. of Mayer's reagent corresponds with ten milligrams of alkaloid; in solutions of double this strength, one Cc. of reagent consumed indicates 12·5 milligrams of alkaloid, while in solutions twice as strong again (1:125) one Cc. of the reagent indicates 15 milligrams of cocaine. In estimating the strength of a solution volumetrically, therefore, by this reagent, it is necessary to obtain in a preliminary experiment a rough approximation to the result, and then, having diluted the solution so that it shall contain nearly one part of alkaloid in 500, to make a second, more careful experiment; but this is true, to a greater or less degree, of all titrations with Mayer's reagent.

A solution of iodine in iodide of potassium produces in a solution containing 1:7,500 of cocaine hydrochlorate a pinkish precipitate; in stronger solutions the precipitate appears brown. A faint yellowish cloud is produced in solution 1:200,000; barely perceptible in a solution 1:400,000.

Phosphomolybdic acid produces a faint turbidity in a solution 1:50,000, and a distinct precipitate in one 1:12,500.

Tannin produces a faint cloud in solutions 1:25,000 (neutral); a distinct precipitate in solutions 1:12,500.

Picric acid produces in strong solutions a yellow precipitate, which assumes crystalline form. In solutions 1:400 the precipitate is thrown down at once, appearing under the microscope in sheaf-like forms. In solutions 1:1,000 a few crystals may be found, appearing after the lapse of some minutes.

Potassium bichromate precipitates only strong solutions (1:25), the precipitate being amorphous or yellow.

Mercuric chloride produces a white amorphous precipitate in solutions 1:100, none in solutions of half that strength.

Caustic alkalies precipitate the alkaloid in crystalline form from moderately dilute solutions; from stronger ones in amorphous state, but soon assuming crystalline form. Thus, in a solution 1:500 ammonia produces at once a white precipitate, which soon changes to stellate groups of crystals. In a solution 1:1,000 the crystals appear in a few minutes; in a solution 1:1,500 the crystals develop only after some time.

Caustic soda and potash produce very similar effects, the crystals perhaps forming more promptly. Where ammonia is the precipitant the crystals often arrange themselves in complicated growths, tufts of acicular crystals springing from the nodes of jointed stems formed by the larger primary crystals. (See Fig. 3, A.)

The carbonates and bicarbonates of the alkalies produce in solutions of the same strength precipitates of cocaine alkaloid, which are at first amorphous, but which gradually take crystalline form, becoming ultimately identical in appearance with the crystals produced by caustic alkalies.

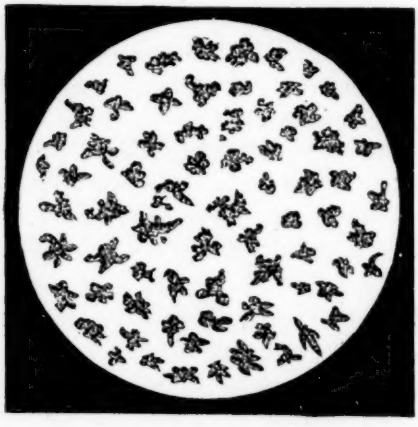

FIG. 5.—Precipitate formed by platinum chloride in solution, 1:500, of cocaine hydrochlorate. X 100 diameters.

Platinum chloride produces at once in solutions 1:400 a yellow precipitate, consisting of plumose crystals, mostly of stellate pattern, bearing thus a general resemblance to snow-flakes. (See Fig. 5.) In solutions 1:800 the crystals are more simple in form, consisting generally of one main crystal, with two or three parallel branches joined at an oblique angle, and these more or less subdivided. In solutions

1:1,600 most of the crystals resemble carpet tacks, consisting of a short, well-formed prism, with a single branch from the centre, joined at an oblique angle and tapered to a point.

A few crystals, similar to those just described, form after some time in solutions 1:3,000.

Chloride of gold produces characteristic crystalline precipitates, assuming peculiarly beautiful forms. In solutions containing one in 3,000 an immediate precipitate is produced, assuming forms resembling those of fern-fronds (Fig. 6), generally with a stellate arrangement.

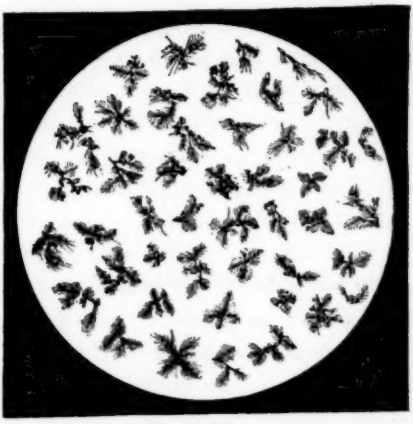

FIG. 6.—Precipitate formed by auric chloride in solution, 1:3000, of cocaine hydrochlorate. X 75 diameters.

In solutions 1:12,500 crystals form after some minutes, showing the same fern-frond patterns, but not generally the stellate arrangement.

A solution was prepared of the amorphous cocaine (cocainoidine) in the form of a hydrochlorate, and a similar series of experiments carried out with this, the general conclusion drawn from which was that the compounds of this alkaloid are very averse to assuming the crystalline form. The precipitates produced by alkalies did not crystallize at all, neither that by picric acid. In very dilute solutions (1:5,000) the chloride of gold produced after some time minute prismatic crystals, wholly unlike in general appearance the compound fern-like crystals obtained when the crystallizable salt was employed. Similarly, in the more dilute solutions (1:1,000) chloride of platinium produced a few rosette-like crystalline aggregations, contrasting strongly in appearance with the feathery forms obtained from the crystallizable

salt. The limit of sensitiveness with different reagents was also in some cases strikingly different, although we must remember that the solution of the amorphous product is itself probably complex in character.

With alkalies the limit was found to be at a dilution of about 1:1000, with platinum chloride 1:1,200, with gold chloride 1:9,000, with picric acid 1:5,000 (that of the crystallizable salt being only 1:1,000), with Mayer's reagent 1:18,000 (that of the crystallizable salt being 1:200,000).

Solutions prepared from the amorphous alkaloid, if evaporated even at a very gentle heat, have invariably turned dark, and if the salt is evaporated quite to dryness it is found to be then imperfectly soluble in water. A solution of the crystallizable salt can be evaporated even at 100°C. without changing color, and the residue is perfectly soluble. It is probable, however, that the body which suffers decomposition in evaporation is a distinct alkaloid or a non-alkaloidal substance, for solutions which have been treated with animal charcoal, or by some other plans for purification, while they still contain amorphous alkaloid in abundance, do not exhibit this behavior.

One peculiarity of even the purest cocaine salts is their disposition to give up their acid, probably a result of the instability of the base. Steel spatulas, etc., exposed to the air in contact with the dry hydrochlorate soon become rusted, but the same thing is often observed in regard to the salts of ammonia and other volatile bases.

The important points which I wish to emphasize are: 1. That the alkaloid obtained from coca leaves consists of a mixture of several different substances, only one of which is entitled to the name of cocaine. 2. That the separation of normal cocaine from its accompanying alkaloids can only be effected by processes of crystallization, either of the alkaloid itself or of some of its salts.

In concluding I desire to express my obligations to the firm of Parke Davis & Co. for the use of their laboratory facilities, and especially for the material aid rendered by them in supplying the illustrations that accompany these notes. I trust that some one more burdened with leisure than the writer will be found to pursue lines of inquiry that I have been able only to indicate, and that our knowledge of the alkaloids of erythroxylon will soon be as full and exact as that of the cinchona group.

DETROIT, MICH., Aug. 24, 1885.

Remarks by the Editor.—As an acceptable supplement to the paper by Dr. Lyons, a botanical plate of Erythroxylon Coca, *Lamarck*, is added, from the leaves of which plant cocaine is obtained. For this plate, which is a reproduction of that contained in Bentley and Trimen's well known work on "Medical Plants," we are indebted to Messrs. Parke Davis & Co., of Detroit. The shrub which is doubtless indigenous to the mountainous districts near the West coast of South America, is extensively cultivated there, and also in the countries east of the Andes. A branch with young foliage and flowers is represented by Fig. 1. The flowers (Fig. 2) have a deeply five-lobed calyx (Figs. 4 and 5), five broadly-clawed petals provided with a ligula (Fig. 3), ten hypogynous stamens, and an ovoid ovary with three styles (Fig. 5), and divided into three cells (Fig. 7), of which two are usually abortive, so as to appear one-celled (Fig. 8). A longitudinal section of the ovary containing one ovule is shown in Fig. 6. The red fruit is drupaceous (Figs. 9 and 10), and at its base is surrounded by the calyx and short tube of the stamens; a transverse section of it (Fig. 11) shows a thin sarcocarp and endocarp, which is filled by the seed, and this contains within a thin testa, the straight embryo and tough albumen. The shape of the stipules and their attachment between the petioles and branches is shown in Fig. 12, and the apex of a leaf in Fig. 13.

ELIXIRS OF QUININE, SIMPLE AND COMPOUND.

By R. Rother.

For obvious reasons, it is desirable that the various elixirs compounded by pharmacists should possess a definite and consistent structure and a general uniformity of the respective kinds. Their method of preparation should partake of a parallel character which, aside from simplicity and facility, should also attain a reasonable accuracy. Beside the distinctive medicinal agent, the characteristic base of all elixirs is an aromatic, sweetened, spirituous liquor. The Pharmacopœia has now recognized a simple elixir in accordance with these requirements. The official aromatic, although simple enough, is far from the best that might have been chosen. The superficial, evanescent and wholly illusive aroma of oil of orange is ill adapted in cases requiring coincidently a decided flavor of permanent character and

limpid solutions. More extended comparisons than have been heretofore made will doubtless show that the oils of orange and lemon are in so far objectionable, in conjunction with elixirs, that their discontinuance in the near future is very desirable. The multiform mixtures that are now so common are equally objectionable. Many simple aromatics are sufficiently grateful without admixture. And in cases of compounds two or at most three simple bodies are invariably superior to a greater number. The main point in their combination consists in finding their due proportions respectively to effect a blending. An excessive variety of compound flavors would be unwarranted. It is doubtless desirable that certain elixirs might be characterized by distinctive aromas, but for general use one particular combination is perhaps preferable. Among the simple flavors cardamom takes a high rank; orange flower water is also a superior flavor; then follow the oils of Ceylon cinnamon, caraway and anise; after which very little of an important or desirable nature remains, although peppermint, vanilla and tonka may sometimes be appropriate. As a compound flavor a mixture of one part of oil of anise and two parts each of oil of caraway and oil of Ceylon cinnamon is very grateful; even equal parts of the two latter form a very palatable compound.

The proportion of alcohol in elixirs should not be excessive. Whilst a considerable augmentation may be useful, in particular instances, to hold certain active constituents in solution, in the generality of cases its large presence would be detrimental by preventing solution. Three sixteenths, that is, one and a half pints, of alcohol in the gallon, is about the proper ratio.

No regard need be had about the alcoholic strength in reference to the solution of the aromatics. Unless the alcohol largely preponderates no perceptible increase of solvent power is attained, all inferior proportions having no greater effect than water alone.

Too little sugar or glycerin would not impart the requisite sweetness, but too much sugar would again exclude an indispensable proportion of solvent, besides imparting an undesirable syrupy consistence. Three-eighths, or forty-eight troyounces of sugar in the gallon is about the right proportion.

It has become habitual to color certain elixirs. Whilst this feature may in no case be essential, it certainly has the effect to relieve a monotonous uniformity. Cochineal is generally used for this purpose,

as it imparts to neutral and alkaline solutions a rich purple tint; acid solutions become scarlet tinted thereby.

In order to facilitate and effect the solution of the oily aromatics, it is customary to incorporate them first with magnesium carbonate. For various reasons this body is objectionable. The writer has for a long time employed precipitated calcium carbonate for this purpose, with very satisfactory results. The process of the Pharmacopœia by means of absorbent cotton is not to be recommended.

The incorporation of the medicinal agents is in many instances accomplished by direct addition. In some cases, however, a special procedure is necessary. But no very important deviation from the fundamental method of preparing the simple elixir is in any case required.

The process for preparing a simple elixir, and essentially most compound elixirs likewise, is based upon certain practical principles demanding at least average attention. The best results are invariably secured by combining the aromatic with the completed menstruum. This is effected by first dissolving the sugar in all the available water and then adding the alcohol; then thoroughly triturating the oils with the calcium carbonate, and gradually adding the menstruum, with constant stirring, until one-sixteenth to one-twelfth has been added; the resulting mixture is then poured into the remaining menstruum, and the whole well shaken at occasional intervals during a period of several hours, and finally filtered. The first small portions of the filtrate are apt to contain a trace of turbidity due to minute particles of calcium carbonate. The remainder, however, passes, beautifully clear and bright, and with acceptable rapidity.

The solution resulting from 48 troyounces of sugar and 4 pints of water measures about $6\frac{1}{4}$ pints. The addition of one and a half pints of alcohol increases this to about $7\frac{3}{4}$ pints, so that after filtration the measure of one gallon is completed by adding water through the filter.

The practice of employing alkaloids in preparing elixirs of cinchona in place of the bark has become almost if not wholly general. The sulphates being the commercial form are mostly used for this purpose.

In connection with iron salts the sulphates do not yield presentable products, and in contact with citrophosphates and citropyrophosphates not only are troublesome precipitates formed, but the resulting solu-

tions are destitute of the desirable light green tints, or speedily lose them, especially on exposure to light. The sulphates are furthermore marked by a persistent and nauseous bitterness, not shown by various other salts. For the reason of their remarkable solubility, moderate bitterness and wonderful permanence of composition, solubility and tint in conjunction with ferric citrate, the hypophosphites command particular notice.

The writer has long been in the habit of preparing an elixir of cinchona containing in the gallon 250 grains, one-third of a molecule, of cinchonium sulphate; 145 grains, one-sixth of a molecule, of quinium sulphate, and 128 grains, one sixth of a molecule, of cinchonidium sulphate; making a total of 523 grains, or two-thirds of a molecule.

Of late the writer has prepared this elixir, as well as its ferrated compound, by replacing the sulphates with hypophosphites. Since, however, these salts of the alkaloids are not obtainable in the market, and since, also, their composition relative to hydrous water is not known, the process embodies their preparation by double decomposition between the sulphates and calcium hypophosphite and solution in alcohol.

It was already found that the mixed sulphates of the alkaloids became mutually so extremely soluble that 8 fluidounces of diluted alcohol sufficed for the ready and complete solution of the 523 grains. With the mixed hypophosphites this solubility is naturally greater. The product obtained from the 523 grains of sulphates and 114 grains, two-thirds of a molecule, of calcium hypophosphite is completely dissolved by 2 fluidounces of warm water and little more than this volume of diluted alcohol in the cold. In strong alcohol the mixture is apparently soluble in all proportions.

From these results the following formula for elixir of cinchona or otherwise compound elixir of quinine is derived:

Cinchonium sulphate	250 grains.
Quinium "	145 "
Cinchonidium "	128 "
Calcium hypophosphite	114 "
" carbonate, precipitated	1 troyounce.
Oil of anise	8 minims.
" caraway	16 "
" Ceylon cinnamon	16 "
Sugar, granulated	48 troyounces.
Alcohol	
Water ..... of each sufficient to make	1 gallon.

Dissolve the sugar in 4 pints of water and add 18 fluidounces of alcohol. Rub the oils thoroughly with the precipitated calcium carbonate and then gradually add, with constant stirring, 8 to 10 fluidounces of the preceding mixture.

Pour this now into the remainder of the saccharine solution and set the mixture aside, shaking it up frequently; then after an interval of about two hours filter it, returning the first turbid portion, and when all has passed through follow with water until the filtrate measures 7½ pints.

Upon the calcium hypophosphite pour 2 fluidounces of water and warm the mixture on a water-bath. Now add the sulphates of the alkaloids, and when double decomposition is complete remove the mixture from the water-bath and gradually add 4 fluidounces of alcohol; then pour it into a small filter, and when all the liquid has passed through follow with alcohol until the filtrate measures 8 fluidounces. Then pour this into the simple elixir first obtained and mix the whole.

It was experimentally found that when ferric citrate, sodium phosphate and quinine are combined soluble double salts only resulted when having the composition $4(FeCi)Na_2(QuH)PO_4$, and $4(FeCi)Na(QuH)HPO_4$. These could be produced in elegant olive tinted scales, but since they did not appear to redissolve in cold water, although freely so when hot, their hydrous water, if any, was not determined.

Ferric citrate and quinium hypophosphite combined, in whatever proportion, yield no soluble double salts; the presence of other hypophosphites appears to be necessary.

A grass-green scaled salt, having the formula $2(FeCi)NaPy(QuH)Py.Aq.$, readily soluble in ⅜ alcohol and in considerably stronger alcohol, yet only sparingly soluble in weaker alcohol, can be easily prepared. It is very difficultly soluble in cold, but abundantly soluble in hot water.

An apple-green, very soluble but non-deliquescent, scaled salt has the formula $3(FeCi)NaPy(QuH)Py$. Its hydrous water was not ascertained, but, as it can be obtained in two very different forms, it appears probable that hydrous water is present in one of the two conditions at least. When a concentrated solution is permitted to dry up spontaneously, a scaled but opaque residue remains, indicating a homogeneous crystalline tendency. If, however, the solution is concen-

trated and further dried by means of heat, perfectly clear and readily detachable scales are formed.

By uniting the constituents so that the expression $3(FeCi)(NaPy)_2$-(QuH)Py results an apple-green solution is produced, which on condensation yields a similarly colored, scaled residue, intermingled by distinct groups of crystals. This product shows that the compound is not homogeneous, but that it is probably a mixture of the preceding salt and sodium hypophosphite. Further addition of sodium hypophosphite causes no disturbance or other visible effect.

Although the compound, having three hypophosphorous acid radicles is not a distinct salt, but a mixture, the writer gives it the preference over the other combination for use in elixirs. This is simply on account of the greater proportion of the medicinally desirable hypophosphites.

When employing a commercial article of ferric citrate in the preparation of elixirs especial care must be exercised not to use the so-called soluble kind, as this is merely the ammonio-citrate. Further care should also be had not to select a ruby tinted kind appearing in flat scales having an equilateral tendency. This is also a hydro-citrate, containing alkali, and hence of indefinite composition. The normal ferric citrate has a garnet tint and occurs in curved oblong scales; it is the only proper form to employ.

Strychnine readily combines with solutions of the double salts of the ferric citro-hypophosphites. And as all these solutions permanently retain their fine apple-green tints, this fact together with the foregoing conclusions has led to the following formula for an elixir of iron, quinine and strychnine. Each fluidrachm of this elixir represents about two grains of ferric citrate, one grain of quinium sulphate and one-sixty-fourth of a grain of strychnine:

Ferric citrate	261 grains.
Quinium sulphate	140 "
Sodium hypophosphite	68 "
Calcium "	28 "
" carbonate, precipitated	60 "
Strychnine, powdered	2 "
Oil of anise	1 minim.
" caraway	2 minims.
" Ceylon cinnamon	2 "
Sugar, granulated	6 troyounces.
Alcohol	
Water ..... of each sufficient to make	1 pint.

Dissolve the sugar in seven fluidounces of water and add one and a half fluidounces of alcohol. Rub the oils thoroughly with the precipitated calcium carbonate, and then gradually add, with constant stirring, one to one and a half fluidounces of the preceding mixture. Pour this now into the remainder of the saccharine solution and set the mixture aside, shaking it up frequently; then after an interval of about two hours filter it, returning the first turbid portion, and when all has passed through follow with water until the filtrate measures 13 fluidounces.

Upon the calcium hypophosphite pour half a fluidounce of water, and warm the mixture on a water-bath. Now add the quinium sulphate, and when double decomposition is complete remove the mixture from the water-bath and gradually add one fluidounce of alcohol; then pour it into a small filter, and when all the liquid has passed through follow with alcohol until the filtrate measures two fluidounces. Then pour this into the simple elixir first obtained and mix the whole. Mix the ferric citrate, sodium hypophosphite and one fluidounce of water, and apply heat until complete solution has occurred. Now pour the elixir of quinium hypophosphite, previously finished, into this solution, and if necessary add water to the msasure of a pint and mix the whole; then add the strychnine, and when this has dissolved filter the elixir if necessary.

Jacaranda lancifoliata. Under this name the leaves of a plant from Columbia, South America have been experimented with by Drs. Murray Smith, Alfred Wright and Z. Mennell, and were found to be very useful in cases of gonorrhœa, syphilis and in vesical affections attended with purulent urine ("Brit. Med. Jour."). The plant named, it appears to us, is identical with Jac. procera, *Sprengel.* A description of the leaves with analysis was published in this Journal 1882, pages 134 and 513. The leaflets are very variable in shape, and Jac. lanceolata, *Velloso,* we believe, is regarded merely as a variety of the species named.

It should be remembered that in Brazil the different species of Jacaranda and of other Bignoniaceæ are known as *caroba* and distinguished by various affixes, while the common name *jacarandá* is there given to various Leguminosæ; according to Peckolt, Drenocarpus microphyllus, *Wawra,* is known as *jacarandá-rosa* and Machærium firmum, *F. Allem.,* as *jacarandá-tau.* J. M. M.

WHAT IS THE CHEMICAL RELATION, IF ANY, BETWEEN THE OILS OF PEPPERMINT AND SPEARMINT?

By Henry Trimble.

Read before the American Pharmaceutical Association.

In answering this query it is necessary to assure the Association that the following experiments were made on pure oils. The purity of the samples was vouched for in every case by those who were personally acquainted with their manufacture.

Sufficient investigation has already been made of spearmint oil to prove that it is different from oil of peppermint, consequently attention has been directed to determining whether there is *any* chemical relation between them, and at the same time corroborating the work already done by others.

History.—Oil of spearmint appears to have been correctly analyzed by Gladstone ("Journal of Chemical Society," 1864), who stated that it consisted of a terpene, $C_{10}H_{16}$, and carvol, $C_{10}H_{14}O$. He separated them by fractional distillation, and by precipitating carvol by means of alcoholic ammonium sulphide.

The result is a mass of beautiful acicular crystals, readily purified by solution and recrystallization from hot alcohol, and, when pure, free from odor, composed of $(C_{10}H_{14}O)_2H_2S$. This compound decomposed by ammonia yields carvol, which has an odor resembling spearmint, although distinct from it. With the exception of the odor this carvol appears to be identical with that from the oils of caraway, dill and nutmeg. The oil examined by Gladstone showed a specific gravity at 14·5°C. of ·9105.

Experiments on Oil of Spearmint.—Three samples were kindly furnished me by Mr. Albert M. Todd, the well-known manufacturer of pipmenthol. 1. A light fraction. 2. A heavy fraction, and 3. The natural oil. The light portion boiled at 174°C., had a specific gravity of ·9078 at 15°C., and failed to deposit any crystals, except water, at — 23°C.

It was distilled under reduced pressure with a two ball fractioning tube. The light portion of this process was repeatedly rectified in the same way until a product was obtained of specific gravity ·866 at 15°C., and boiling at 160° to 165°C. This was found on combustion to contain over three per cent. of oxygen. The odor of spearmint had

disappeared, a peculiar terebinthinous odor replacing it. The supply of this being exhausted, the natural oil was fractioned, the light portion treated with metallic sodium and distilled from it three times.

A combustion of this gave the following:

Carbon	84·42
Hydrogen	12·28
Oxygen	3·30
	100·00

It was then allowed to stand over sodium for two weeks, and distilled. The first portion which came over boiled at 160° to 167·5°C., and had a specific gravity of ·861 at 15°C. A combustion of this gave:

Carbon	84·52
Hydrogen	12·27
Oxygen	3·21
	100·00

According to Gladstone the pure hydrocarbon boils at 160°C., and has a specific gravity at 20°C. of ·860.

Another attempt was made to get the pure hydrocarbon by treating the oil with alcoholic ammonium sulphide, to remove the carvol, and rectifying the filtrate. But a decomposition occurred on heating this filtrate, and a greenish oil containing sulphur distilled over.

The second fraction in the distillation of the volatile oil, consisting largely of carvol, was submitted to a temperature of — 23°C. No separation of crystals occurred.

There remained in the flask after distillation, whether by direct heat or by forcing steam through the oil, a thick, dark brown, resinous substance, almost free from the odor of spearmint, and apparently a usual constituent of the oil. This will be referred to again under peppermint.

Experiments on Oil of Peppermint.—The oil of peppermint exposed to temperatures varying from — 10° to — 23°C. did not deposit crystals. It was then fractioned under reduced pressure, and the heavy portion crystallized by exposure to a low temperature.

For experiments on the light product of the oil, I used a sample sent me by Mr. Todd, who, at my request, favored me with about 4 ounces of a light oil, being the distillate gotten by taking 120 pounds of natural oil, distilling 5 pounds, taking 28 ounces of this and dis-

tilling 4 ounces. This was treated and distilled 3 times with sodium, then submitted to combustion with the following result:

Carbon	84·08
Hydrogen	12·19
Oxygen	3·73
	100·00

As this contained so much oxygen it was allowed to stand on sodium for a week. The light portion gave on combustion:

Carbon	83·96
Hydrogen	12·28
Oxygen	3·76
	100·00

This boiled at 163°C., and had a specific gravity of ·855 at 15°C. Gladstone gives 175°C. as the boiling point of the hydrocarbon $C_{10}H_{16}$, and the specific gravity ·8602 at 20°C. He does not, however, give his method of separation, and I fail to find that anybody has ever separated this compound. I do not give the result of the combustions as evidence that there is no hydrocarbon present, but to show that it exists in very small quantity, and that it is isolated with extreme difficulty, as already shown when the light portion resulting from the distillation of 120 pounds of the oil, rectified twice by Mr. Todd, still contained oxygen after prolonged treatment with sodium. Mr. Todd states as his opinion that the amount of hydrocarbon does not exceed 5 per cent. It is probable there is not even that much present. It is well known that a very small proportion of the hydrocarbon will prevent the crystallization of the pipmenthol.

After the distillation of the heavy portion of the oil, there remained a resinous mass very similar to that obtained from spearmint oil. It is probable that both oils contain this resin, and that the quantity is increased during the process of distillation. This view is the result of experiment, as well as of a statement from Mr. Todd that the distillate, in fractioning the oil, increases in specific gravity until the middle or latter part of the operation, when it begins to decrease, which is due, no doubt, to a decomposition, resulting in the formation of the resin.

Summary.—1. The oils of spearmint and peppermint probably contain hydrocarbons which are identical.

2. These hydrocarbons exist in much smaller proportion than heretofore supposed, and are isolated with great difficulty.

3. Oil of spearmint contains, as the oxygenated portion, carvol, $C_{10}H_{14}O$, which does not solidify at — 23°C., and is precipitated by alcoholic ammonium sulphide.

4. Oil of peppermint contains, as the oxygenated portion, pipmenthol, $C_{10}H_{20}O$, which is a crystalline solid at ordinary temperatures, and is not precipitated, when in solution, by alcoholic ammonium sulphide.

5. Both oils contain resins, almost free from odor, and formed in part during the process of distillation.

ON THE PURITY OF COMMERCIAL SPANISH SAFFRON.

By John M. Maisch.

Read before the American Pharmaceutical Association.

In order to obtain samples of Spanish saffron which would fairly represent its commercial quality, it was not deemed advisable to procure them from retail stores; but at the writer's request, a friend, who uses considerable quantities of saffron in his business, procured a number of samples directly from importers and large dealers, in the summer of 1884, so that the results of my investigation may be assumed to indicate the actual condition of the market in Spanish saffron as held in first hands. Two firms had each sent a specimen of Valencia and Alicante saffron, with the statement that the former was of their own importation, and the latter merely kept to supply to customers purchasing cheap goods. In the following synopsis the samples are grouped together in accordance with their relative purity, and are designated as was done by the dealer; the samples not specially designated, are understood to have been received simply as "Spanish saffron."

1. Valencia saffron. Of good appearance and odor, supple but not clammy; consists of the stigmas with a moderate proportion of the yellow style attached, and mixed with few stamens and a still smaller number of fragments of petals.

2. Valencia saffron. Closely resembling the preceding, and containing the same admixtures, in about the same proportion, except that the pollen seems to be present in somewhat larger quantity; this pollen floats upon water, does not separate a white sediment, and does not effervesce with acids.

3. Valencia saffron. Like the preceding sample, with which it closely agrees in all respects.

4. Valencia saffron. Resembles the preceding sample, but contains decidedly more of the style, which in some cases measures over 25 Mm. (1 inch); stamens and corolla fragments are present in moderate proportion.

5. The appearance of this sample is good, but very deceiving. It is free from stamens and powder, and contains but few styles and corolla tubes, also a few fragments of green crocus leaves, the latter doubtless an accidental admixture; but it is largely adulterated with calendula florets, dyed with red saunders in close imitation of the color of the stigmas of crocus.

6. Commercial Spanish saffron. Resembles the preceding sample; is free from corolla tubes, but contains, besides some styles, a few corolla fragments and many calendula florets dyed with red saunders.

7. This sample resembles those marked "Valencia saffron;" it contains a rather larger proportion of styles with a few corolla fragments, and is free from stamens; but it is loaded with a powder consisting of pollen and a moderate amount of calcium carbonate.

8. Although slightly clammy, the appearance of this sample does not excite suspicion; it contains a considerable proportion of styles, some yellow stamens and yellow calendula florets; but the principal amount of adulteration is dyed with Brazil wood, and consists of stamens, corolla shreds, corolla tubes, calendula florets, and of a powder composed of little pollen with much calcium sulphate.

9. Alicante saffron. More clammy than the preceding and resembling it, but free from calendula florets and the mineral adulteration consisting of calcium carbonate.

10. Identical with the preceding in composition and appearance.

11. This sample, weighing only a few grains, consists principally of corolla tubes with adhering powder of calcium carbonate, both dyed with Brazil wood, and containing a small proportion of saffron.

12. Likewise a very small sample, consisting largely of crocus stamens and corolla tubes with adhering powder of calcium sulphate, all dyed with Brazil wood, some of the crocus stigmas are rather light colored and have probably done service before, yielding now a rather pale reddish yellow infusion.

13. Does not contain a particle of crocus, but consists exclusively of florets of Carthamus tinctorius, *Lin.*, collected shortly after the

expansion of the flower-heads, when they are of a bright orange yellow color, and on drying acquire a red tint. The thin cylindrical tube of these florets is from 8 to 12 Mm. ($\frac{1}{3}$ to $\frac{1}{2}$ inch) long, and is above divided into five linear-lanceolate lobes 6 or 8 Mm. ($\frac{1}{4}$ or $\frac{1}{3}$ inch) in length; of about the same length is the yellow tube of the anthers, from which two short lobes of the stigma and a portion of the yellow top of the style projects about 2 to 6 Mm. ($\frac{1}{12}$ to $\frac{1}{4}$ inch); this portion of the style is cylindrical and like the outside of the terminal lobes, finely hairy, while the long lower portion of the style is filiform, smooth and of an orange red color.

A few weeks ago, on learning of a recent importation of Valencia saffron, application was made to the importer for samples, which were obligingly furnished. Each of the two samples weighed 30 grains, and since both were of very good appearance, entirely free from mineral additions, and had only moderate portions of the styles present, they were carefully searched for all other impurities present. In No. 14 were found two stamens and two corolla shreds not dyed, while from No. 15 were obtained three stamens of their natural color, and the following substances dyed with Brazil wood, namely one corolla tube, two corolla shreds and two calendula florets. The weight of these latter impurities is quite insignificant—less than one grain—and their presence in the samples may probably be accounted for by accident rather than design, although in lots of several hundred weights of saffron, the addition of two or three per cent. of material of no value would yield a snug profit, for which the purchaser did not contract to pay. This remark applies also to samples Nos. 1 to 4, described above.

Before referring to the different admixtures and adulterations, I may be permitted to state as the result of this investigation, my conviction that while Spanish (Valencia) saffron of fair quality can readily be obtained in our market, a large proportion of it (Alicante saffron) is more or less heavily adulterated; at the same time it should be remarked that not one of the samples is as good as it should be. There are upon the table three specimens of absolutely pure saffron, consisting solely of the stigmas without a trace of the yellow style, and of which one came to this country from Germany in 1871 as a special sample, another was raised in Lancaster county, Pa., about the year 1868, and the third was produced in Lebanon county, Pa., in 1882. It is to be regretted that the home product cannot be procured in suffi-

cient quantity to supply our market; this condition of affairs might perhaps be altered in the course of a few years, if dealers would consent to pay the price demanded by the domestic producers of saffron, namely an equal weight of silver coin. Sample No. 13 seems to indicate, that some persons are still selling safflower in the place of Spanish saffron.

In the investigation of the samples procured in 1884, no attempt was made to determine the percentage of impurities; but that there are different grades of "Valencia" saffron in the market, and that "Alicante" saffron is manufactured so as to contain sometimes much less than half its weight of crocus stigmas, becomes evident when price lists are consulted. In proof of this assertion the following statements are quoted from a trade circular from the southern part of France, issued near the close of July, 1885.

"No fresh supplies being brought to the Valencia market, on account of the cholera there, stock has decreased to about 10,000 lb., and although business appears at a stand-still for the moment, prices are kept firm and show an upward tendency. *Real extra superior Valencia* is wanting. *Superior Valencia* is being kept at francs 81·75 to f. 83·75 per kilo f. o. b. (= 29 shil. 8 pence to 30 shil. per lb. f. v. C.), and *good pure Valencia* fetches from f. 78·75 to f. 77.—per ko. f. v. C. as to quality (= 28 shil. 7 pence to 27 shil. 11 pence per lb. f. o. b.)—For *Alicante* adulterated saffron our makers on the spot ask, say for *extra superior Alicante*, f. 52.—per ko. f. v. C. (= 18 shil. 10 pence per lb. f. o. b.), and for *lower grades* from f. 40.—to f. 30.—per ko. f. o. b. as to quality (= 14 shil. 6 pence to 10 shil. 10 pence per lb. f. o. b.). All above quotations to be understood for cases of ¼ tins, each of 25 lb. net."

Nearly all European writers on materia medica have, during the present century, regarded French as being superior to Spanish saffron. A. L. A. Fée (Hist. Natur. Pharmac., 1828, I, 341), Guibourt (Hist. Natur. des drogues simples IV), Soubeiran (Nouv. Diction. des Falsif., etc., 1874, p. 494), Baillon (Botan. Médic. 1884, p. 1422), and other French authors describe Gâtinais saffron as the best and purest, containing but few styles, while the saffron from Angoulême and Avignon contains a considerable quantity of this admixture. Soubeiran also states that Spanish saffron (doubtless the best quality is meant) differs little from that of Gâtinais, contains fewer yellow threads and is more dry and red; but that it is frequently adulterated. The same general

judgment is also alluded to by Andrew Duncan (Edinb. New Disp. 1805, p. 209) and by W. T. Brande (Manual of Pharmacy, 1825, p. 72), and is expressed by German and Austrian writers, who, however, place before the Gâtinais saffron that of Austrian origin, which consists of good sized stigmas, is free from styles and other impurities, but is produced in insufficient quantity to exert any important influence on the general market, conditions which apply equally well to the excellent saffron of Pennsylvania origin. Bentley and Trimen (Medic. Plants, p. 274) and Flückiger and Hanbury (Pharmacographia, p. 668) likewise state that French saffron is usually purer and enjoys a better reputation than that of Spain or Italy. How then, it may be asked, does it happen that in the United States, Spanish saffron is regarded as the best kind, and that most American writers praise it as such? In searching the literature on this subject, it was found that in 1834 (see Buchner's Repert., vol. 49, p. 458) F. Jobst pronounced the best and dryest kind to be the Spanish saffron, which formerly had been usually oiled, a fact mentioned by J. A. Paris (Pharmacologia), A. T. Thomson (London Dispensatory, 3d edit., 1822, p. 267), F. P. Dulk (Phar. Boruss. Comment., 1829, I. 405) and others, and subsequently repeated by Royle (Mat. Med. Amer. edit., 1847, p. 601), Schleiden (Pharmacogn. 1857, II, 338) Clamor Marquart (Lehrb. d. Pharmacie, 1865, I, 385) and others. But Jobst's statement was corroborated by Pereira (Elem. of Mat. Med., 3d Amer. edit., 1854, II, 219) with this qualification, that Spanish saffron constitutes the best saffron of the shops, and that French saffron is usually considered in commerce to be of second quality. This, very likely, is the origin of the high esteem in which Spanish saffron has been generally held in American commerce and by most American writers.

The adulterations of commercial saffron may be divided into two classes, namely, such which are derived from the same plant, and such coming from other sources. The most common of the first class consists of styles, the presence of which has been observed in *all* commercial samples of Spanish saffron which have been examined by me on the present occasion, as well as formerly; the variations consisting merely in the relative proportion of these yellow threads. Next in order of importance are crocus stamens, which more than fifty years ago were remarked by Martius ("Pharmacognosie," p. 220), dyed so as to resemble the stigmas in color. The same adulteration was subsequently noticed by Bentley ("Phar. Jour. and Trans.," March,

1866; "Amer. Jour. Phar.," 1866, p. 225), and minutely described by him, with illustrations. Two years previous ("Jour. de Phar.," June, 1864), Guibourt perceived a similar adulteration in a specimen of French saffron, the dyed stamens, however, being those of Crocus vernus, *All.*, the anthers of which are cylindrical and rounded at the apex, while those of Crocus autumnalis are arrow-shaped. In the samples examined by me the latter alone were found; in some cases they still had their natural yellow color, in other cases they were dyed.

Bentley was the first one who observed also the presence of corolla tubes attached to the stamens of the saffron flower, and described them in the paper referred to. This adulteration seems to have attracted little attention; but it is evidently very extensively practised at the present time, as will be seen from the samples under examination, one-half of which are thus adulterated. When first noticed by me, and before it had been placed under the microscope, it was supposed to consist of meat fibres, which Duncan, Thomson, J. A. Paris ("Pharmacologia," 2d American edition, 1823, p. 123), Fée, F. V. Mérat and A. J. De Lens ("Dict. de Mat. Méd.," 1830, ii, 468), P. L. Geiger ("Handb. d. Phar.," 1830, ii, 355; "Pharmac. univ.," 1835, i, 55), J. F. Royle ("Mat. Med.," Amer. edit., 1847, 601), and others had enumerated among the adulterations of saffron. Some of the more recent German writers have repeated this statement; others merely give directions for the detection of such an admixture, and many, like all the recent French authors consulted by me, omit to mention it, doubtless because it has never been observed by them. Neither has it been seen by Pereira, for he, like Duncan, remarks (*loc. cit.*) that fibres of smoked beef *are said* to have been used for adulterating saffron, and J. R. Coxe ("Amer. Disp.," 1st edit., 1806) followed Duncan, using precisely the same language.

Some American writers are silent on this subject for the reason just stated; and I may add that various English, French and German journals of the present century have been searched in vain for a report on an authenticated case of such a sophistication; still it is mentioned by some American writers, apparently upon the authority of the early authors quoted before. Geiger ("Handbuch") describes these supposed fibres of smoked meat (ham) as being of uniform thickness, odorless, of little taste and not coloring the saliva, or, if dyed, imparting to it a slight yellow color. This description applies equally well to the corolla tubes. It should be stated, however, that, according to

Bentley and Trimen, the admixture of fibres of shredded beef is a common adulterant in Italy. The best means for detecting this adulteration is, without doubt, the microscope, which reveals the transverse striæ of meat fibres. The odor of burning meat differs materially from that of burning vegetable matter, and has been recommended as the principal test by most authors, even as late as 1865 by Marquart; but on experimenting with a few shreds only it may be misleading; it certainly should be regarded merely as a preliminary test, and the most reliable one, the microscope, is very properly insisted upon by careful modern writers.

The corolla tubes observed by me were dyed in one case with red saunders, in the others with Brazil wood. The frequency of this adulteration and its close resemblance to saffron suggested the probability of its having been overlooked in samples examined before; but those saffrons—many of them adulterated—which I had procured between 1866 and 1876 were entirely free from the tubes; it is possible that this sophistication is only occasionally used, or merely for certain cheap grades.

The petals of pomegranate, cut and twisted, were mentioned by Fée, Geiger, and by Dulk, and since their time by others, as being used for adulterating saffron, for which their crimson and after drying brownish purple color render them fit to a certain extent; but they contain tannin, giving with ferric salt a blue-black color, which was in no case observed with the corolla shreds taken from the samples under consideration. The petals of Saponaria, mentioned by some authors as adulterants, are almost white, and, to be used as an admixture to saffron, must therefore be dyed; seen under the microscope, they are nearly opaque, or merely translucent, while the corolla shreds—dyed and undyed—noticed by me were almost transparent, and their delicate structure was observed to be identical with shreds still attached to some of the filaments of crocus stamens, so that there can be no doubt of their origin.

From the above it would seem as if for some commercial grades of saffron the entire crocus flower was utilized, though not in the condition suggested by Monthus, in 1867 ("Jour. Phar. Chim.," 4th ser., vi, 54), who recommended to simply dry the flowers, which he regarded as possessing the same medicinal properties as the stigma; he also states that acids color the flowers red, and ammonia green. Applied to calendula florets, acids render the yellow color lighter, but ammonia

darkens it. For the inferior grades of saffron the corolla tube is cut into pieces usually about 20 mm. ($\frac{4}{5}$ in.) long, the stamens are pulled off, and the corolla lobes are torn into shreds; these different parts are then dyed, somewhat rolled and twisted, and mixed with true saffron in sufficient quantity to suit the cupidity of the manufacturer and the price offered by the dealer.

Several of the substances used for adulterating saffron, and not derived from the saffron plant, have been mentioned above; in addition to these, a long array of vegetable substances are enumerated by different authors, and it is obvious that any material may be used which is thread-like or slightly clavate, or may readily be twisted into such a shape, and in addition to this possesses sufficient flexibility and may be dyed in close imitation of the natural color of saffron. It would, therefore, seem to be superfluous to mention any of these substances, since with the aid of the microscope—in most cases even to the naked eye, after a sample has been soaked in water—their different shape is at once revealed. The most important of these sophistications, besides those of mineral origin, consist of florets of composite flowers, more particularly of carthamus, which has been described above, and of the ligulate ray florets of Calendula officinalis, *Lin.* The latter attain a length of 20 or 25 Mm. ($\frac{4}{5}$ to 1 inch), and consist of a short tube and a long strap-shaped limb, 2 or 3 Mm. ($\frac{1}{12}$ or $\frac{1}{8}$ inch) wide, terminated at the apex by three teeth, and marked by four delicate longitudinal veins, of which two are marginal and beneath the teeth united with the two central veins. The limb is smooth, but the outside of the tube is covered with rather long, very thin-walled, colorless hairs, which in the dried condition are more or less twisted and collapsed, so as to present a somewhat moniliform appearance. If not dyed, these florets, on account of their yellow color, can be used for the adulteration of saffron only to a limited extent, perhaps not exceeding about 2 per cent. in weight, and may then readily be taken as portions of crocus styles. However, the dyed florets are more largely used, and, though many red coloring matters may answer for the purpose, the principal ones employed appear to be either red saunders or Brazil wood, both of which will impart a color similar to that of saffron. If dyed with red saunders, the coloring matter will not be taken up by water, but will dissolve in alcohol with a red, and in ammonia with a purple-red color. If dyed with Brazil wood, the infusion in water will be tinged red in a few seconds, the color becoming paler on the

addition of an acid, and deeper red on the addition of ammonia; but the infusion is not blackened by salts of iron. A few fragments of a red wood, found in two or three of the samples of saffron, showed the same behavior, and by microscopic examination and comparison with Brazil wood were proved to be identical with the latter. In order to make the dyed calendula florets more closely resemble true saffron, they are rolled or twisted in such a manner as to assume an approximately cylindrical shape. In several of the samples examined a number of elongated bodies, curved near one end, and there divided into several nearly cylindrical parts, were observed, bearing some resemblance to the stamens of papilionaceous flowers, deprived of the anthers. But the hairs described before at once revealed their true nature, and after soaking these bodies in water they could be separated into from 6 to 12 calendula florets, which during the manipulation for rendering them saffron-like had been twisted together by the strap-shaped portion of the petals, while the tubular parts remained distinct. It is very likely that the ray florets of Calendula arvensis, *Lin.*, as stated by Guibourt ("Jour. Phar. Chim.," May, 1841, p. 315), are used in precisely the same manner. The marigold of our gardens is very frequently this species, which is distinguished from Calendula officinalis, *Lin.*, by the more lanceolate stem leaves, the pale yellow and usually shorter ray florets, and the erect (instead of incurved) akenes of the *outer* row; the tubular portion is beset with the same kind of hairs.

Logwood could not be detected in any one of the samples examined; the crocus tubes, in most cases, also the corolla shreds, and frequently the stamens, were dyed with either red saunders or Brazil wood. The stamens were also generally rolled in such a manner that the anthers were not readily recognized until after immersion in water, when they expanded and revealed their valves, the cells of which, near the margin, are somewhat irregularly quadrangular, and gradually change towards the connective to a transversely elongated form.

Several of the earlier writers on saffron mention sand and pieces of lead as mineral adulterants. The first account of a mineral salt, lead carbonate, being used for this purpose, I have found in the dictionaries of Chevallier, Richard, and Guillemin (1829), and of Mérat and De Lens (1830); subsequently it is rarely mentioned. The use of chalk in this connection appears to have been first noted by Heræus, but was not reported to a scientific journal until 1870, though published in the "Gazette de Marseille" in the fall of 1860. The same

adulteration was reported in 1869, in France, by Blacher, and in 1870, in Switzerland by Rehsteiner, in England by Hanbury, and in the United States by me. Gypsum was also observed as an adulteration in the year 1869 ("N. Jahrb. Phar.," xxxii, xxxiii), and since that time both calcium salts, occasionally also the corresponding barium salts, have been invariably found as fraudulent admixtures in certain grades of Alicante saffron, rendered somewhat adhesive by means of honey, glucose or glycerin, which substances, owing to their hygroscopic nature, have the additional advantage of preventing the saffron from getting too dry.

Adulterations with exhausted saffron were practiced at an early day, and are mentioned, in 1718, by John Quincy ("Pharmacopœia officinalis et extemporanea," p. 164), and in 1733 by James Alleyne ("Engl. Dispens.," p. 36).

The conclusion that may be drawn from these facts and statements is that saffron, in common with every medicinal article, should be carefully examined by the purchaser for all possible admixtures; for unceasing vigilance is the best if not the only guarantee for the purity of drugs.

ON THE MEDICAL PROPERTIES OF TWO RHAMNUS BARKS.

By George W. Kennedy.

Read before the American Pharmaceutical Association.

Query 21. Is there any difference in the laxative action of Rhamnus Purshiana and Rhamnus Catharticus?

Experiments undertaken with the view of answering this query require considerable time and labor, since a number of important points are to be taken into consideration in order to be able to reach a satisfactory conclusion, and the omission of either one will cause more or less uncertainty in the results. One of these results is the proof that the two drugs under consideration require somewhat different menstruums for stable liquid preparations, since the menstruum which will thoroughly exhaust the virtues of one of the drugs and hold the principles in perfect solution, will not answer for the other. In order to ascertain if possible the relative strength of these two drugs the fluid extracts were believed to be the most convenient and satisfactory form for experimentation, and they were prepared as follows:

Take of the bark in moderately fine powder	℥xvi
Alcohol (95 per cent.)	f℥xi
Glycerin	f℥ij
Water	f℥iii

Mix the above fluids, moisten the powder with a portion of the mixture, pack properly in a glass conical shaped percolator, cover the surface of the powder with a disc of paper, and add the remaining menstruum. When the liquid begins to drop from the percolator, close the lower orifice with a cork, and having closely covered the percolator, to prevent evaporation set it aside in a moderately warm room for four days. The cork is then removed, more menstruum, composed of eleven fluidounces of alcohol and five fluidounces of water, is added gradually, and the percolation continued until twenty-four fluidounces are obtained of which the first thirteen are reserved; the remainder is carefully evaporated to two fluidounces, then add one fluidounce of alcohol, and mix with the reserved portion.

This menstruum is not sufficiently strong in alcohol to make a permanent preparation of Rhamnus Catharticus; but by increasing the alcohol in the above formula to twelve fluidounces in the pint, excellent results were obtained and no precipitation of any consequence took place in the fluid extract after standing for several months. When made of the weaker alcoholic menstruum a deposit took place shortly after the preparation was finished, but none occurred in the fluid extract of Rhamnus Purshiana, which was made about nine months ago. The taste of the two preparations differs somewhat; while that of Rhamnus Catharticus is unquestionably very bitter, yet it is not near so strong as the bitterness of the Rhamnus Purshiana.

To satisfy myself that the drugs were thoroughly exhausted the powders were administered and found to have no laxative properties whatever. The precipitate alluded to above, a portion of which I collected by decantation, was of a brownish color and dissolved completely in liquor potassæ, with a deep purplish-red color, characteristic of the resin. By the addition of dilute acetic acid the purplish-red color of the alkaline solution was immediately destroyed, and a brownish colored mass thrown down, which was thrown into a filter, repeatedly washed with water, and dried. It is soluble in alcohol, diluted alcohol, and the alkalies, insoluble in chloroform and ether, and nearly so in water, thus corresponding in appearance and tests

with the rhamno-cathartin found in the juice of the buckthorn berries by Binswanger, in 1849. Repeated attempts to crystallize this substance were not successful. On being administered in four grain doses it had a decided cathartic action, and in doses of three grains was strongly laxative.

The separation of this substance from the fluid extract induced me to investigate the subject a little deeper than at first intended. Accordingly a small quantity of the resin was made from each bark by a process noticed below, and the yield ascertained, as well as the medicinal action. In the meantime the fluid extracts were placed at the disposal of several of my medical friends who rendered me valuable aid and reported their conclusions, which agree so closely in the more important points, that it would be superfluous to give them all in detail.

The following report from Dr. I. D. Wiltrout, of Hudson, Wis., appears to cover the subject quite thoroughly:

"The samples of fluid extract of Rhamnus Catharticus and Rhamnus Purshiana given me for trial have more than met my highest expectations. I used these preparations in cases of constipation characterized by atony, or paresis of the muscular coat of the bowels, induced by a catarrhal condition of the stomach and small intestines. They gave free evacuations in small doses, say from 30 to 50 drops, with no pain, and materially improved the appetite. The evident action is upon the nerve terminals and in this way reflectly stimulating muscular contractibility and glandular secretions. The common experience was that a diminished dose was needed to assure the daily purpose. I also used the remedies on women in whom the colon was allowed to distend from neglect and inattention; in all instances they were efficient. I think these remedies might be usefully prescribed with aloes when there is no pelvic or uterine difficulty, and thus act on the whole bowel. I have prescribed these remedies in combination with the phosphate of sodium in chronic constipation, attributable to a bilious condition. It wonderfully accelerates the action of the phosphate and arrests a sick headache promptly, and does not deplete the system. I think these remedies have a wide province and if the extracts are always as reliable as those you sent, will be used in the cases enumerated. I have prescribed these remedies in a large number of cases and my conclusions as to their relative strength is, that a smaller quantity of the Rhamnus Purshiana is required both as a laxative and as a cathartic, but it is a little nauseating."

In regard to the squeamish action of the drug noticed by Dr. Wiltrout, in the Cascara Sagrada, this has likewise been observed in the bark of the Rhamnus Frangula the first year after gathering, but when two or three years old retains only the purgative power, and is much similar in its effect to that of rhubarb, consequently most authorities forbid its use until two years from the time it is gathered, and the Norwegian Pharmacopœia requires the bark to be kept one year before it is used medicinally. The glucosic fermentation which is now admitted to take place by age in the Frangula, may likewise take place in the Purshiana. On this point I am unable to give an answer as I could not ascertain the age of the bark operated on.

The resins of both species were obtained from the concentrated alcoholic tinctures by adding them with constant stirring to water, when subsidence had taken place, decanting the supernatant liquids, washing the precipitates twice by decantation, with fresh portions of water, and drying them.

Eight ounces of the bark was operated on in each case. The bark of Rhamnus Purshiana yielded 250 grains, or about $6\frac{3}{10}$ per cent. of resin, which is dark in color and almost black, but if dissolved in caustic potash solution and precipitated by diluted acetic acid it is of a brown color. It is very bitter, of a granular appearance, and contains a small quantity of a yellow fixed oil, which on a piece of white paper produces a greasy stain. The resin is soluble in alcohol, diluted alcohol, in sulphuric acid with a reddish brown color, and in liquor potassæ with a purplish red color; it is insoluble in chloroform and ether. In doses of 1 to 3 grains it acted as a laxative and cathartic. The extractive matter obtained by evaporating the water used in precipitating the resin amounted to $1\frac{1}{2}$ ounces, or $18\frac{5}{10}$ per cent., making a total yield of both of $24\frac{8}{10}$ per cent. The watery extract is of a dark reddish brown color, when perfectly dry breaks with a snap, the fracture being glossy, but when exposed to damp air it becomes soft and sticky; it has an intensely lasting bitter taste, much stronger than the precipitated resin, and its physiological action is similar, 2 to 3 grain doses having laxative effects, and 5 grains acting as a cathartic. It is soluble in a large quantity of water, freely so in dilute alcohol, sparing soluble in alcohol, and almost insoluble in chloroform and ether; with sulphuric acid it forms a reddish brown solution, and with liquor potassæ makes a clear solution of purplish red color.

The yield of resin from the Rhamnus Catharticus is not so large as

from the former, 8 ounces yielding 160 grains or $4\frac{1}{8}$ per cent., and by evaporating the aqueous fluid used in precipitating the resin 210 grains or $5\frac{5}{10}$ per cent., making a total of 370 grains or $9\frac{2}{3}$ per cent. The resin is found to be soluble in diluted alcohol, alcohol, in liquor potassæ with a claret wine color, in sulphuric acid with a red color; also in ether and chloroform, but insoluble in water. The aqueous extract was soluble in water, sparingly soluble in alcohol, soluble in dilute alcohol, insoluble in ether and chloroform, soluble in liquor potassæ with a purplish red color and in sulphuric acid with a reddish brown color. As to the laxative and cathartic properties of these two I found the resin decidedly the stronger, requiring 3 grains for a laxative action, while the aqueous extract required 4 to 5 grains to have the same effect.

From the above observations on the resins and extracts obtained from these barks, I would unhesitatingly conclude that the preparations manufactured from Rhamnus Purshiana are decidedly the more active. Before closing I desire to return my thanks to Messrs. Parke, Davis & Co., of Detroit, Mich., who kindly accommodated me with material to make these investigations.

TINCTURE OF VANILLA.

By R. Rother.

After vanilla pods there are few if any other crude articles to be found in mercantile pharmacy having such a diversity of quality as inferred from their market value. In consequence, tincture of vanilla for flavoring purposes can be prepared rich in vanilla at a relatively moderate cost, and scant in vanilla at a comparatively exorbitant cost. Connoisseurs claim that they can easily discern the differences in these various preparations. Since, however, the consuming public are in no sense experts in such matters, all grades of these products find a ready market. Viewed from the standpoint of the trained palate, the public taste is exceedingly perverted when it deliberately prefers tonka-mixed vanilla or even tonka pure and simple to the best vanilla.

Manufacturers of flavors have not been slow to recognize the advantage of such a disposition to themselves, and as a consequence of the greatly increased demand the cost of tonka bean has steadily risen to an unprecedented level of late years. The cost of vanilla has, however, appreciably declined. That this was caused by the introduction

of artificial vanillin and the decreased demand for pure vanilla flavor is, however, not the case. The probable reason is very likely to be found in the new natural sources of supply that have of recent years been developed. The fresh supplies appear to be so abundant and rich that the natural vanillin obtained therefrom has not only crowded out the synthetic article, but incidentally reduced the cost to a remarkable degree.

The Pharmacopœia has at this late day embodied a formula for tincture of vanilla. It bears a rather antique form, and it is perfectly safe to add that pharmacists who have occasion to prepare large quantities of the tincture will ignore the official process in every particular. In this preparation there is no need for the presence of any sugar whatever. Such an unusually strong alcoholic menstruum as is officially used is also unnecessary, to say nothing of the objectionable features still outstanding.

Macerating the sliced pods with diluted alcohol constitutes the simplest and best process that can be applied. Where much material is operated on, the extraction is preferably accomplished by the procedure of remaceration. When tonka is conjointly used the operation need not be varied, as its relation to the menstruum is even more favorable than that of vanilla. The crude material may be exhausted with diluted alcohol, separately or coincidently. Their combined extraction is, as a rule, more convenient.

A tincture containing one ounce of each vanilla and tonka in the pint is very satisfactory, although half an ounce of tonka may ordinarily suffice.

Estimating that the yield of vanillin from vanilla pod is 2 per cent., and that of coumarin from tonka bean the same, then eight troyounces of each will contain, in round numbers, 80 grains of the principles respectively; it is, however, allowable that it is much less even from apparently the best material. This amount of pure principles costs scarcely half that of an equivalent quantity of good crude substance. However, the writer has for some time past prepared a tincture from pure crystallized vanillin and coumarin, containing three drachms of the first and one drachm of the second, or half a troyounce of the two together, in the gallon. This is twice the best possible yield of the crude material, or twice the ordinary strength of the tincture. As the composition here is largely in favor of vanilla, the cost of the resulting product is correspondingly enhanced. It is, however, barely more

than half that of a proportionate amount of the raw product. This tincture is therefore twice as strong at half the cost of that as ordinarily made, or a difference in its favor as four to one.

Although diluted alcohol is necessary for extracting the activity from the crude substances, a much weaker alcohol will suffice for simply holding the principles in solution. Two pints of alcohol to the gallon of tincture is ample. The crystals dissolve but slowly in 25 per cent. alcohol, but almost instantly in strong alcohol, which solution may then be diluted without change. It has been deemed advisable to add some glycerin to the tincture, as it is held that such addition is beneficial in bringing out flavors of all kinds. The tincture is colored with liquid caramel or sugar color, and thus presents the full appearance of that obtained from the natural bodies. It is prepared according to the following formula:

Vanillin, crystallized	3 drachms.
Coumarin, "	1 "
Caramel, liquid	2 fluidrachms.
Glycerin	4 fluidounces.
Alcohol	2 pints.
Water	sufficient to make 1 gallon.

Dissolve the vanillin and coumarin in the alcohol and add four pints of water. Mix the caramel and glycerin with one pint of water and pour it into the first solution, together with enough more water to make the tincture measure one gallon, and filter it if necessary.

CHOLAGOGUES.—Dr. Baldi, in the Archives Italiennes de Biologie, gives a series of experiments with reputed chologogues. The Doctor is not in accordance with either Rohrig or Rutherford. Rohrig found that colocynth was the most active chologogue, and then jalap, aloes, senna, and rhubarb. Rutherford believed the order to be, prodophyllin, rhubarb, aloes, colocynth, and senna. Baldi experimented with podophyllin, rhubarb, jalap, pilocarpine, aud Carlsbad water; and from his results is inclined to doubt the chologogue value of all these agents.—*Pac. Med.* and *Surg. Jour.*, May. 1885.

JABORANDI IN OBSTINATE HICCOUGH.—Pagenstecher (Ctrlbl. f. d. ges. Therap.) reports a case of hiccough which had resisted every known remedy, including the bromides, morphine, chloroform, and electricity. The patient's diaphragm contracted in the most violent manner about twenty or thirty times a minute, and he had been unable to take any nourishment for three days. After receiving four grams of jaborandi-leaves, in the form a decoction, he had a profuse perspiration, after which the hiccough was completely checked.—*The South. Pract.*, May, 1885

GLEANINGS FROM FOREIGN JOURNALS.

By J. Robert Moechel.

Detection of Blood in Urine.—A new, sure and simple method by means of which the peculiar color of blood is obtained is given by Antonio Luchini in "L'Orosi." To 10 cc. of urine, in a test-glass, add one drop of acetic acid and 3 cc. of chloroform, and shake well. In the presence of blood, the subsiding chloroform will show more or less of the red blood-tint, according to the quantity of blood present. Luchini experimented with personally prepared solutions of blood, and observed the reaction to be successful with a solution containing 3 drops of blood in 250 cc. of water.—*Schweiz. Wochenschrift f. Ph.*, 1885, p. 220.

Diphenylamine., $(C_6H_5)_2NH$, is a very delicate reagent for the detection of nitrogen acids and for free chlorine. H. Hager recommends two solutions as being convenient for use: 1, 1 gram of diphenylamine in 30 cc. of absolute alcohol, and, 2, a mixture of 1 volume of this solution with 5 or 6 volumes of pure sulphuric acid, as diphenylamine sulphate. Both solutions are yellowish, and the latter becomes blue in the presence of nitrogen acids and other oxidizing agents.

For the detection of chlorine, place 3 or 4 cc. of the suspected liquid in a test-tube of 1 cm. width and pour 1 to 1·5 cc. of sulphate of diphenylamine carefully down the side of the tube, so as to let it collect on the bottom. According to the quantity of chlorine present, a blue coloration will be observed between the layers of the two liquids, or the whole of the lower liquid will be colored blue. Very slight traces may be detected if to 3 or 4 cc. of liquid 1 to 5 cc. of diphenylamine sulphate be added with the care stated above, so as to have two layers. Place the tube upon a sheet of white paper and shake well; a transient blue coloration, rapidly vanishing, will be observed; somewhat larger traces of chlorine show the blue color for a longer time.—*Ph. Centralhalle*, 1885, pp. 277–279.

Naphthol, $C_{10}H_7OH$, is a delicate reagent for the detection of nitrates and the nitrogen acids, though not as delicate as diphenylamine. Hager succeeded in detecting 1 in 5,000 and obtained a fainter, but still distinct reaction with 1 in 8,000 parts. The solution for use contains 1 part of naphthol in 100 parts of strong or absolute alcohol. For applying the test, place in a test-tube, of 1·2 cm. width, 3 or 4 cc.

of the colorless (or nearly so) suspected liquid; mix with 2 cc. of the above solution, and add carefully 1·5 to 2 cc. of pure concentrated sulphuric acid, as stated under dyphenylamine. Suddenly, or in a few seconds, the acid surface assumes a yellow, reddish brown or brownish black coloration. For the detection of traces of the acids (1 in 5,000), add at first but 1 cc. of pure sulphuric acid; after a minute shake and mix; then add with care 1·5 cc. of pure sulphuric acid, and wait 1 to 2 minutes, when the surface of the acid shows a dark color. After 4 or 5 minutes shake well, to mix the fluids, which, if the nitrogen acids were present in very slight traces, will have a decidedly yellowish color. By adding sulphuric acid in three portions a yellowish color, resembling that of white wine, was obtained with $\frac{1}{8000}$ HNO_3.—*Ph. Centralhalle*, 1885, p. 353.

Naphthol as a Reagent for Free Chlorine and Bromine.—Chlorine or bromine give with a 1 per cent. solution of naphthol in alcohol a whitish turbidity and precipitate, the latter assuming from chlorine a yellowish green and from bromine a yellow color. If the detection of mere traces of chlorine and bromine be the object, place in a narrow test-tube 3 or 4 cc. of the liquid to be tested, and then pour down along the side of the test-tube 0·5 cc. of the naphthol solution; in a few minutes a white turbidity will be observed between the two layers, extending when slightly shaken. If the two layers be mixed, a white opalescence or turbidity will be the result. Traces of chlorine will show, in about 15 to 30 minutes, a greenish tint; bromine, a yellowish one. Chlorine or bromine, 1 in 30,000 of liquid, will show the reaction in a few minutes; if in 40,000 parts of liquid, 10 to 12 minutes were required, and this is about the limit of dilution for this reaction. Care as to the dilution is needed; for instance, hydrochloric acid ought to be weaker than 20 per cent., nitric acid about or weaker than 10 per cent., etc.—H. Hager, in *Ph. Centralhalle*, 1885, p. 366.

Orange Wine.—Pour upon the peel of two or three oranges, placed in a vessel, 1 liter of hot white wine; cover and set aside for three hours. Dissolve 625 grams of sugar in half a liter of pure water; mix the resulting syrup when cold with the vinous infusion, and, if desired, color with saffron; filter and bottle.—*Science pratique; Leitm. Rdschau*, 1885, p. 432.

Cement for Plaster Casts.—Macerate small pieces of celluloid in ether; pour off the light liquid and use the remaining thickish mass

as cement, which dries quick and is insoluble in water.—*Ibid.* from *ibid.*

Excellent Polishing Powder for Metals.—Magnesia 40 parts, carbonate of calcium 40 parts, red oxide of iron 7 parts.—Chevalier, in *ibid.*

Cement for Tubes of Glass and Copper.—Mix very finely powdered gypsum with oil until the mass becomes somewhat hard; then for every 50 parts of oil incorporate 100 parts of albumen by trituration in a mortar. This cement must be used at once, since it hardens rapidly.—*Ibid.* from *ibid.*

A permanently elastic solution of acacia is, according to "Wien. ill. Gew. Ztg.," obtained in the following way: Dissolve 93 parts of acacia in sufficient water to obtain a liquid of syrupy consistency. Dissolve 1 part of salicylic acid in 20 parts of alcohol; add 3 parts of glycerin and, lastly, 3 parts of green soap, and mix. This solution keeps well, and besides being very elastic possesses considerable adhesiveness.—*Erfind u. Erfahr.*, No. 9, 1885.

Antidiabetic Chocolate.—Glycerin, 500 grams, is to be reduced, at a low temperature, to 300 grams; then melt 1,000 grams of Caracas cacao, freed from oil, and stir with the glycerin until incorporated. Salts, aromatics, sugar, etc., may be added if ordered by the physician. —*Bulletin gén. de thérapeutique*, 1885, p. 512.

In place of reducing the glycerin by evaporation, use only 300 grams of concentrated glycerin, thus avoiding the loss of 200 grams of glycerin.

Remedy for Freckles.—Halkin ("Ann. Soc. de Liège") recommends to proceed as follows: Wash the skin well and dry; then paint the spots by means of a brush which has been slightly dipped in melted carbolic acid, at the same time stretching the skin by means of the fingers. Let dry without washing or removing the forming skin, which after some time assumes the natural color.—*Ph. Centralhalle*, 1885, p. 344.

OXALIC ETHER.—Richardson ("Asclepiad") recommends this compound for hypodermic injection. It is obtained by digesting absolute alcohol and oxalic acid at a moderate temperature, and is a colorless liquid of an agreeable odor. Unlike sulphuric ether, it does not cause pain when injected under the skin, and the resulting inflammation is slight. It is suggested as a useful application to morbid growths, either externally or by deep injections.—*N. Y. Med. Jour.*, June 20, 1885.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

By the Editor.

(Continued from page 435.)

Culantrillo de México, Adiantum tenerum, *Swartz;* Filices; in Central Mexico. The pinnæ are dark green, rhomboid, wedge-shaped at the base, the inferior margin entire, and the superior one lobulate in the fertile fronds, and dentate in the sterile fronds; the stalks smooth, shining and blackish. It is employed as a substitute for the European maiden hair, and in Guadalajara the decoction (two to four drachms to a pint of water) is much used as an aperient and for promoting the flow of the lochia.

Cundeamor, Momordica Charantia, *Lin.;* Cucurbitaceæ; in Tabasco and Yucatan. According to Leon the leaves are anthelmintic, and the roots aphrodisiac.

Curaro, Ourari, Wourari. The dose cannot be fixed. It may be given in injections of 0·001 Gm. frequently repeated until the physiological effects are produced.

Chautle, Blettia campanulata, *La Llave;* Orchidaceæ; in temperate regions of Mexico. A decoction of the tubers of this plant is used in dysentery. In like manner are employed the tubers of allied plants, such as Blettia coccinea, *La Ll.*, Epidendrum pastoris, *La Ll.*, Arpophyllum spicatum, *La Ll.* and others.

Chayote, Sechium edule, *Swartz;* Cucurbitaceæ; cultivated. The fruit and little tubers are alimentary. A. Herrera found in the fresh tubers potassium tartrate and other salts, albumen, sugar, bitter resinoid matter, and 20 per cent. of starch which is employed as a substitute for arrow root.

Chia, Salvia Chian, *La Llave;* Labiatæ; in the central table-land of Mexico, and cultivated in various parts of the Republic. Oliva found in the seeds starch, drying oil and mucilage. Mixed with water their bulk is considerably increased; this mixture flavored with sugar and lemon juice, furnishes a refreshing drink. The seeds are also used in the form of cataplasm as an emollient, and introduced into the eye for extracting therefrom extraneous bodies. (See also "Am. Jour. Phar.," 1882, pp. 227, 229, 261, 585.)

Chicalote, Argemone mexicana, *Lin.*, A. ochroleuca, *Salm*, and

A. grandiflora, *Salm;* Papaveraceæ; in the valley of Mexico, etc. The milk juice is used in skin diseases and mixed with water, for removing from the cornea incipient opacities and spots. The flowers are pectoral and narcotic. The leaves, externally applied, are a remedy against headache, and are stated to contain a small quantity of morphine. Dr. Hamilton found the seeds to be narcotic, and the fixed oil obtained from them is drastic in doses of fifteen to thirty drops.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-third annual meeting of this Association convened in Lafayette Hall, in the city of Pittsburg, on Tuesday afternoon, September 8th, President John Ingalls in the chair. The Local Secretary, Mr. G. A. Kelly, introduced Mr. G. H. Anderson, Vice-President of the Chamber of Commerce, who tendered the use of the rooms of that body for any business connected with the meeting, and extended a hearty welcome from the business men and citizens to the members. The President, on behalf of the Association, returned thanks, and then proceeded to read his annual address, which, on motion of Prof. Markoe, was referred to a committee for considering and reporting upon the suggestions contained therein. Mr. Kelly then spoke words of welcome on behalf of the resident members and of the pharmacists and druggists of Pittsburg and Allegheny City; he also stated that a number of industrial establishments would be open for inspection by the members and their friends, and read a letter from the Petroleum Exchange, inviting the members to visit their building. These invitations were accepted with thanks.

The Permanent Secretary read the report, showing that delegates to this meeting had been appointed by 12 Colleges of Pharmacy, 24 State Pharmaceutical Associations, 10 County or City Associations, and 6 Alumni Associations.

On motion of Prof. Oldberg the Secretary was directed to send a message of greeting to the British Pharmaceutical Conference then in session in Aberdeen, Scotland.

On motion of Dr. Menninger the members of the Medical and Pharmaceutical professions of Pittsburg and vicinity were invited to the sessions, with the privileges of the floor.

Mr. M. N. Kline, in behalf of the delegation from the National Wholesale Druggists' Association, made some remarks, commenting on the aims of, and the work done by, the American Pharmaceutical Association. On behalf of the latter Mr. Sheppard responded.

The reports of Committees were then called up, and laid upon the table for future action, after which the Nominating Committee was appointed and the minutes of the Council sessions during the past year were read, also the reports of the Publishing Committee and of the Committee on Membership, the latter showing a slight decrease in the number of members as compared with the previous year. The report of the Committee on

Prize Essays was made by one member, owing to the absence in Europe of another, and the illness and death of the third member; it was referred to the Council for further action. After the appointment of several committees, a motion to adjourn until Wednesday morning was carried.

The second session opened with the reading of the minutes of the preceding day and of the Council, and the report of the Nominating Committee, followed by the election of officers for the ensuing year. Mr. Jos. Roberts, of Baltimore, was elected President; A. H. Hollister, of Madison, Wis., Prof. A. B. Prescott, of Ann Arbor, Mich., and Joseph S. Evans, of West Chester, Pa., Vice-Presidents. The remaining officers and retiring members of Council were re-elected; the formation of the Committee on the Drug Market was postponed, and the other standing committees were left unchanged, except that Prof. V. Coblentz, on the Committee on Papers and Queries, took the place of Mr. Sloan, declined, and Prof. Oldberg, on the Committee on Prize Essays, the place of Mr. Parsons, deceased.

The report of the Drug Market was read by Mr. M. N. Kline, and was ordered to be printed in circular form for distribution to the members, and to be published in the Proceedings.

The report of the Finance Committee contained various suggestions, chiefly in relation to the annual audit of the Treasurer's accounts. In compliance with the regulation of the Council, made for the purpose of affording ample time for the thorough examination of the books and accounts, the Treasurer reported on the financial condition of the Association on July 1st, which is the beginning of the financial year, instead of at the time of the meeting, as was customary heretofore; on this account the report shows a smaller cash balance than would otherwise have been the case. As verified by the Auditing Committee, the funds of the Association on the 1st day of July were as follows: General fund, cash in bank and on hand, $4,278.79; Permanent fund from life memberships, etc., $1,429.47; Ebert fund, $729.55; Centennial fund, $1,359.36.

The Committee on Legislation pointed out some of the differences in the pharmacy laws, showing that there is no unity of sentiment or action in regard to the fundamental principles which should guide pharmaceutical legislation. The failure before Congress of the bill relating to apothecaries of the Army and Navy was reported, and a synopsis was given of the requirements, together with the full text of the new pharmacy laws of Kansas, Maine, Massachusetts, Michigan and Minnesota, as well as such portions, relating to pharmacists, of the prohibitory laws of Kansas of March 7, 1885, and of the new penal code of Minnesota.

The Committee on Legislation on Proprietary Medicines presented a carefully prepared argument in favor of requiring each package of such medicines to contain a sufficient statement of the composition; also the draft of a law for regulating the sale of proprietary medicines. The resolution attached to the report and adopted by the meeting declares "that it is the deliberate opinion of this Association that the labels of proprietary medicines ought to carry a statement of their constituents."

A report was read from the delegation to the meeting of the National Wholesale Druggists' Association at St. Louis, and from the Committee on Unofficinal Formulas.

A number of amendments to the by-laws previously proposed were then acted upon, as follows:

Chapter IX, Article II, Sect. 4, was altered so as to abolish the calling of the roll at the first session; and Sect. 7 so as to constitute the Nominating Committee from representatives of the delegations of Colleges of Pharmacy and State Pharmaceutical Associations. Article IV of the same chapter was amended so as to devote the third and subsequent sessions to the reading of papers, with the exception of the first hour, when other business may be transacted, under the proviso that the reading of papers may be suspended with the consent of three-fourths of the members present at the remaining sessions. Other matters occupied the attention of the Association repeatedly during the time set apart for the papers, and it was evident that a practical change in the manner of transacting the business had not been attained. Article V of the same chapter, relating to the exhibition, and all references to the exhibition, were ordered to be stricken out, thus doing away with the holding of exhibitions under the auspices of the Association.

The amendment proposed to Chapter IV, Article IV, increasing the Treasurer's salary from $500 to $750 was not concurred in; but at the next session the vote was reconsidered and the amendment carried.

The Council was then instructed to consider the expediency of reducing the expenses of the Association, and to report thereon as early as convenient.

An adjournment was then had to the Exhibition room, the third session to commence Thursday, at 9 A.M.

At the third session a Committee on the time and place of the next annual meeting was appointed.

A series of resolutions offered by Mr. Leo Eliel created considerable discussion, and were finally lost, apparently because of being regarded impracticable. The resolutions deprecated the mixing of remedies by manufacturing pharmacists; advised the manufacturer to present remedial agents free from admixture; declared against empiricism in all its forms; condemned the manufacture of unauthorized combinations, and the methods of forcing these upon the dispenser, as being unprofessional, unjust to the dispensing pharmacist and at variance with scientific advancement in pharmacy and in medicine; and affirmed it to be the duty of the pharmacist to meet all requirements of physicians, and never to dispense "factory-made prescriptions," unless ordered by the prescriber.

A report from the Committee to report on the unofficinal formulas presented last year, offered to the Association the formulary prepared and copyrighted by the New York and Brooklyn Pharmaceutical Societies, under certain conditions. After considerable discussion the further consideration of the subject was postponed until the next session, when the offer was accepted in a somewhat modified form; accordingly the formulary will be published in the next volume of the "Proceedings," and when the necessary revision has been made, will also be published in such a form so as to place it within easy reach of all pharmacists.

A cable message was received from the British Pharmaceutical Conference,

signed by J. B. Stephenson, President, "heartily reciprocating kind greetings."

A number of papers were then read and discussed, of which brief summaries will be found below.

At the fourth session, held Friday morning September 11, the Committee appointed at the previous session reported in favor of holding the next annual meeting in the city of Providence, Rhode Island, which was adopted, amendments in favor of San Francisco and of Detroit having been negatived. The first session will be held on the afternoon of the first Tuesday of September, 1886. Mr. W. B. Blanding was elected Local Secretary, and by special resolution, also chairman of the Committee on Entertainments, with authority to appoint four associates. This Committee was instructed not to make any arrangements interfering with morning and afternoon sessions on the second and third days of the next meeting.

On motion of Mr. Colcord last years' Committee on the report on unofficinal formulas was made the Committee on unofficinal formulas for the ensuing year.

A Committee to visit the National Wholesale Druggists Association at its meeting to be held in Philadelphia in October, was appointed, consisting of Mr. C. A. Heinitsh, Lancaster, Pa., Charles Caspari, Jr., Baltimore, Jas. T. Shinn, Philadelphia, Charles Bullock, Philadelphia, and Jos. L. Lemberger, Lebanon, Pa.

The Committee on the President's address reported on the suggestions contained therein, recommending

1. That instead of abolishing the initiation fee, it be merged with the life membership fund.

2. That outlines of the courses of pharmaceutical studies would be useful, but their preparation and publication could not be advantageously undertaken by the Association.

3. That employers should exercise unremitting care in choosing the material for the future pharmacist by thoroughly examining each applicant desiring to enter the drug business in the branches of an English education (arithmetic, including proportions, orthography, grammar, English composition, geography and American history).

4. That the proper test of fitness of a candidate for the license of a State examining board is the State examination.

To carry out the first recommendation an amendment was offered to Article IV of the Constitution, which will be acted on at the next annual meeting.

An interesting letter to the Local Secretary, from Mr. Samuel F. Troth, dated Philadelphia, eighth month, 20th, 1885, was read. On that day sixty-nine years ago Mr. Troth entered the drug business; he is the only one living that was present at the first *suggestion* of organizing the Philadelphia College of Pharmacy in 1821, attended the first course of lectures in 1821-1822 with a class of thirty-one, was elected a member Fifth month, 22d, 1822, and of the first one hundred members only three are now living, two of the original ones, each being over ninety years of age, and himself; although in his eighty-fifth year, and retired from business for more than a quarter

of a century, he still takes great interest in pharmacy, and still prepares most of the medicines used by himself and family.

A number of papers were read and discussed, and a larger number, for want of time to read them, were referred for publication.

After passing votes of thanks to the Local Secretary and his co-laborers, to the Entertainment Committee, and to the drug trade and citizens of Pittsburg and vicinity, the thirty-third annual meeting came to a close.

The following papers were presented to the Association:

Phamaceutical Notes, by H. T. Cummings, M. D., of Portland, Maine. *Ergot*, deprived of fixed oil by petroleum benzin, yielded a fluid extract, which retained its efficiency after standing for three years. The powdering of crude *opium* may be facilitated by washing it with benzin. *Bulky vegetable drugs*, like leaves, flowers, etc., when powdered, are thereby reduced in volume. The *specific gravity* of liquids may be taken by accurately weighing ten cubic centimeters of the same. *Water* containing organic and mineral impurities, may be purified by alum, of which 1 Gm. was in one case sufficient for two quarts of foul smelling and dark colored water taken from the bottom of a cistern.

Precipitates in Fluid Extracts, by Prof. J. U. Lloyd. This is a continuation of the researches reported in previous years. Strong solutions of seven chemical compounds were treated with strips of filtering paper to complete saturation; the remaining solution, in all instances, retained *less* of the chemical than it orignally contained; but the liquid expressed from the paper, instead of being stronger than the original solution, was in all cases *weaker*. The solutions of citric acid and of ammonium carbazotate expressed from the paper were of about the same strength as the solutions left from the original ones after having been partly absorbed by the paper. Still weaker expressed solutions were obtained with berberine hydrochlorate, sulphuric acid, oxalic acid, quinine hydrochlorate and quinine bisulphate. The first portions of the expressed solution of the last named salt having formed crystals within a few minutes. Mr. Hallberg suggested that this might be due to the abstraction of sulphuric acid and the formation of the less soluble diquinine sulphate. Prof. Lloyd had found it necessary to add sulphuric acid in order to dissolve the crystallized salt in the liquid. Prof. Prescott spoke of the importance of these investigations for theoretical science, and as aiding the explanation of the true causes for the necessity of prolonged washing of precipitates and for other chemical operations.

The Preparation of Galenical Liquids from Fluid Extracts, by Prof. O. A. Wall. The author sums up his arguments by stating that tinctures and wines may be legitimately made from fluid extracts, likewise most syrups when they can be made that way, while the solutions of fluid extracts in water which generally are superior, are yet frequently so different from infusions and decoctions in strength, and occasionally in mode of action, that they cannot indiscriminately be used one for the other without the expressed consent of the prescribing physician.

Coloring Elixirs, by J. W. Caldwell, Detroit. This is advocated solely because it is required by the physician and the public. A red color from cochineal is suggested for the elixirs containing bromides, valerianates, alkaloids or chloral; a tincture made of cudbear is recommended for iodides,

arsenites, salicylates and monobromated camphor; and tincture of annatto which gives an amber tint, is regarded as suitable for the various combinations of lithium, bismusth, pepsin and strychnine, while elixirs containing cinchona alkaloids are preferably colored with caramel.

Elixir of Calisaya with Iron Salts, by E. Boeking, Wheeling. A mixture of elixir of calisaya with citrate of iron and quinine is not unfrequently prescribed and as dispensed by different pharmacists varies in color and appearance. The author finds this to be due to the manner in which the elixir is prepared, some using alkaloids for this purpose, others calisaya bark, red bark, or inferior grades of cinchona, the absence or presence of tannin, and in the latter case the varying proportions of cinchotannic acid, causing the difference in color after the addition of iron salts. The adoption of a formula by the U. S. Pharmacopœia, of elixir of calisaya is recommended.

Quinine in Elixirs, by Jos. Feil, Cleveland. By the use of quinine hydrochlorate in the place of quinine sulphate, most of the difficulties are avoided which are usually experienced in the preparation of compound elixirs of quinine, such as the elixir of quinine, strychnine and phosphate of iron. A solution of this salt, sufficient for one pint of the elixir named may be prepared by dissolving 140 grains of quinine sulphate in four fluidounces of hot alcohol, adding a solution of 18 or 20 grains of sodium chloride in one drachm of water, and decanting or filtering from the precipitated sodium sulphate.

Preservation of Mucilage of Acacia, by Thos. W. Watkins, Olyphant. Comparative experiments made with tolu balsam, oil of eucalyptus and oil of gaultheria show that the latter has the greatest preservative properties. The proportions used were oil of gaultheria, 15 minims; calcium phosphate sufficient, water eight ounces, acacia four ounces. Other articles, like syrup of acacia, simple syrup and lard may possibly be preserved by the addition of the same oil.

Infected Solutions, by Dr. R. G. Eccles, Brooklyn. The cryptogamous growth observed in many solutions after having been kept for some time is discussed in a lengthy paper. Regarding the effect of these plants upon health, it is contended that while they may not be the cause of disease, their irritating presence may aggravate the suffering. They may be removed by Pasteur's filter of unglazed porcelain, but not by other kinds of filters. The question as to whether these plants are algæ or fungi has not been completely settled; their structure and final development are in favor of the former view. They do not appear to be ferments; but in some solutions putrefactive bacteria are developed. Diluted phosphoric acid, thus infected, after forty days, had not decreased in specific gravity or in neutralizing power. These plants evidently live upon the carbonic acid and ammonia, derived from the air or dissolved in the liquid, and their filamentous sheaths are composed of cellulose. The plants are killed by a boiling temperature, and of the antiseptics tried, mercuric chloride was found to be the best, and about forty times stronger in its action than salicylic or benzoic acid, each of which acted as a preservative in dilutions of 1 : 2,000, or 2,500 or 3,000. The paper was accompanied by a number of microscopic drawings.

A note by Prof. L. E. Sayre, of the Kansas University, stated that phosphoric acid, in which these plants had grown for eleven months, had not decreased in acid strength, and that Dr. Formad of Philadelphia regards the plants as not being of a poisonous or deleterious character.

Assay of Tincture of Opium. Two papers were presented, by Prof. E. L. Patch, and by W. W. Bartlet, of Boston. Both authors advocate a standard strength for the tincture, the opium to contain either 14 per cent. (the officinal strength of denarcotized opium), or 12 per cent. of morphine (the minimum officinal strength of powdered opium.) The assaying should be effected by evaporating the tincture, mixing the residue with lime, and operating further, essentially in the manner directed by the Pharmacopœia for the assaying of opium.

Commercial Abstracts, by Prof. V. Coblentz, Springfield, Ohio. The abstracts of seven manufacturers were examined. Abstractum aconiti. The percentage of alkaloids varied in five samples, regarded as being of good quality, between 0·20 and 0·38, and fell in two to 0·012 and 0·018. Four samples of abstractum jalapæ reached the U. S. Pharmacopœia standard for resin in jalap root, varying between 24 and 26·3 per cent., the three remaining samples containing only between 10·4 and 17·4 per cent. Only one sample of Abstractum nucis vomicæ reached or exceeded the lowest alkaloidal strength of the seeds (2·74) observed by Dunstan and Short (see "Amer. Jour. Phar.," 1883, p. 468); it contained 5·96 per cent. of mixed alkaloids, while the remaining six samples varied between 1·52 and 4·62 per cent.

Liquor Ferri Nitratis, by L. Dohme, Baltimore. The present officinal formula yields a clear amber-colored, slightly acid liquid, which will keep an indefinite length of time, yielding upon assay 2 per cent. of ferric hydrate. To obtain uniform results the solution of tersulphate of iron and the nitric acid must both be of officinal strength.

Oleate of Mercury, by Prof. Emlen Painter, New York. The author's results are summed up as follows:

1. Pure oleic acid for the preparation of a 20 per cent. oleate of mercury is equal to an acid containing a small percentage of stearic acid, though not superior to it; but for the preparation of an oleate of the officinal strength it might preferably contain sufficient stearic acid to make it of the consistence of a soft solid.

2. Purified red oil made from good fresh fat is in every way suitable for making this oleate.

3. Very finely triturated red oxide of mercury is preferable to the yellow oxide, and no artificial heat whatever should be employed in making this preparation.

4. Oleate of mercury is best prepared by the direct union of the oxide and acid.

5. Petroleum ointment is a proper diluent for the oleate containing a less percentage of mercury than the combining proportions, and to facilitate its preparation about an equal weight of the petroleum ointment should be mixed with the oxide before the acid is added.

6. Glycerite of starch (plasma) will probably be found a suitable excipient for diluting this oleate.

7. The idea that true oleates are formed only by double decomposition is absurd; just as much of a chemical compound is formed, as by mixing a mineral acid with the base, or as is formed by making an oleate from oil and a base, the latter being the source of the oleic acid, when the oleate is made by double decomposition.

Pills of Potassium Permanganate, by Prof. E. L. Patch, Boston. The author has used resin cerate as an excipient, also kaolin with water and kaolin with petroleum. Critical experiments as to the keeping qualities have not been made, but it is thought that such pills should be freshly made when prescribed.

Mr. Sloan said that making such pills with the requisite quantity of simple cerate, and keeping them for a year, they will at once show the pure red color of permanganate solution on the addition of a drop of water. Profs. Remington and Markoe regarded the effects supposed to be due to this salt to depend upon the manganese hydrate which is formed in contact with organic matter. Mr. Finlay used Venice turpentine, and Prof. Painter employed wax as an excipient. Mr. Klie regarded compression of the salt as preferable, which Prof. Bedford suggested would act too energetically.

Pills of Silver Nitrate, by Prof. E. L. Patch, Boston. Good excipients are obtained by using lycopodium and extract of gentian, French chalk and resin cerate or kaolin and petrolatum. Mr. Sloan cautioned against the use of steel spatulas in making such pills.

Diachylon Ointment. Prof. J. M. Good, St. Louis, Mo., recommends the following as an improvement upon the officinal article: Melt together lead plaster 50 parts, petrolatum 49 parts; stir well and add oil of lavender 1 part.

Prof. Patch suggests a modification of Deringer's formula (see "Am. Jour. Phar.," 1880, p. 473). The precipitated plaster is remelted and worked with glycerin to replace the water mechanically retained. Melt 64 parts of this plaster, add slowly 72 parts of best olive oil, and stir well while cooling, incorporating 1 part of concentrated tincture of benzoin.

Caustic Potassa in sticks. Prof. E. Goebel, Louisville, examined eight commercial samples which varied in KHO between 66·3 and 74·4 per cent.; K_2CO_3 between 6·7 and 15·8 per cent.; KCl between 0·8 and 1·1 per cent, and water between 17·6 and 22·2 per cent.

Prof. E. L. Patch examined six samples in which the variations were for KHO between 61·4 and 81 per cent., and for K_2CO_3 between 2·5 and 8·6 per cent. The other impurities, chloride, sulphate, silica and iron were examined qualitatively.

Commercial Black Antimony, by Prof. R. B. Warder, Lafayette, Ind. Of nine samples purchased in Western cities not one was genuine; hydrochloric acid dissolved a portion of each sample, usually with violent effervescence in the cold, but without evolution of H_2S, and no trace of antimony could be detected. Six samples procured in Boston, New York and Philadelphia were soluble in HCl (except a small residue) with moderate evolution of H_2S and yielding solutions containing antimony.

Commercial Tartar Emetic. Prof. Warder examined thirteen samples, which gave no indication of arsenic by Fleitmann's test, were entirely free

from iron and chlorides, and with the exception of one, also free from traces of sulphates, while eight contained traces of calcium, and two left a white residue, probably antimonious oxide, insoluble in water. The commercial salt is therefore usually nearly pure.

Commercial Calomel, by Prof. E. L. Patch, Boston. These salt from three American and one English manufacturer was examined, the four samples containing mercuric chloride in small amount, the English sample rather more than two of the American samples.

Commercial Glycerin. Three papers were presented by Profs. E. L. Patch, E. Goebel and R. B. Warder. The result of these investigators was that the samples, forty-six in all, conform very nearly to the requirements of the Pharmacopœia.

Commercial Chloroform, by Prof. P. W. Bedford, New York. Of five samples examined one reached the pharmacopœial specific gravity, 1·486, while others varied between 1·460 and 1·480. In other respects the samples came up, or very nearly so, to the pharmacopœial requirements.

Arctic Flora, by G. W. Kennedy, Pottsville, Pa. A list of thirty-two plants, most of them determined, which were gathered by Sergeant Elison, one of the victims of the Greely Arctic Expedition.

Exportation of American Drugs, by L. A. Haber, Cleveland. For the year ending June 30, 1885, the exportation of acids was valued at $133,582; pot and pearl ash, $37,782; dyes and dyestuffs, $656,148; ginseng, 377,345 lbs., $751,168; patent or proprietary medicines, $1,317,483; roots, barks, seeds and flowers, $116,695; all other medicinal articles, $1,793,328. A number of crude drugs, volatile oils and other articles which were exported are mentioned in the paper; but their quantities can only be estimated.

Dandelion and Chicory, by Jos. Feil, Cleveland. The author suggests that the Pharmacopœia should drop dandelion from the officinal list and admit chicory in place thereof, because he thinks that both are alike in their medicinal action; that, in addition to costing less, chicory is usually found in the market of good quality, and because, judging by the taste, it equals the best quality of dandelion, and is stronger than nine-tenths of that root as found in this market.

Importation of Menthol, by Prof. P. W. Bedford. This was about 4,000 lbs. in 1884, and is estimated to reach about 5,000 lbs. in the present year, and 6,000 lbs. in 1886.

The following three papers are published in full in this number: *On the medical properties of two Rhamnus barks*, by G. W. Kennedy, Pottsville; *on the oils of peppermint and spearmint*, by Prof. H. Trimble, Philadelphia, and *on commercial Spanish saffron*, by Prof. Maisch.

PICROTOXIN IN THE NIGHT-SWEATS OF PHTHISIS.—In several cases in which atropine, quinine, and ergot had proved unsuccessful, Dr. Westbrook obtained excellent results with picrotoxin. It was given by hypodermic injection in doses of one half to one milligram ($\frac{1}{120}$ to $\frac{1}{60}$ grains), gradually increased to three milligrams. It was also efficacious when given by the mouth.—*Louis. Med. News.*, June 13, 1885.

BRITISH PHARMACEUTICAL CONFERENCE.

On Tuesday, Sept. 8th, the twenty-second annual meeting of the British Pharmaceutical Conference was commenced at the appointed hour in the Hall of the Young Men's Christian Institute, Aberdeen, under the presidency of Mr. J. B. Stephenson, of Edinburgh. After the members had been welcomed to Aberdeen by the convener of the Local Committee, Mr. James Sim, and the welcome had been acknowledged on their behalf by the Chairman, the report of the Executive Committee was read by the senior Honorary General Secretary, Mr. S. Plowman. This shows that the Conference is maintaining its prosperity and extending its influence to India and the Colonies. The Treasurer, Mr. Umney, next submitted the Financial Statement, showing that the subscriptions of members during the year had exceeded £750, the balance being practically of the same amount as last year.

The President's Address, which followed, was devoted, in the first place, to a review of the true character of pharmacy and its present position in Great Britain. Taking the ground that pharmacy is essentially an integral part of medicine, having a well-defined and increasingly important character, he insisted that it could be only adequately cultivated by a class of workers devoted to its practical exercise, its chief function being indicated and defined by the word "dispensing." The recognition of this more purely professional aspect of pharmacy was gaining ground, not only with the medical profession, but with the public at large, at least in theory, however much there might still remain desirable in practice. It was, he considered, also recognized by the Legislature in the Pharmacy Act, 1868, which constituted the Pharmaceutical Society, the statutory exponent of that position. Although, however, this statutory recognition existed, it was not unaccompanied by indications of jealous regard for other interests, among which he referred to the requirement that the examiners appointed by the Council of the Society should be approved by the Privy Council, the separation of the office of examiner from that of a member of Council, and the provision for the examinations being attended by a representative of the Privy Council. Notwithstanding the jealousy thus indicated by the State, in charging itself with the responsibility involved by these requirements, he held that there was ample evidence of the true position of pharmacy being recognized by the Government of the country, so that the Pharmaceutical Society, being the recognized statutory exponent of pharmacy, it had, not only the right to regulate the examination, but had also imposed upon it the duty of taking such steps for rendering them effective as might from time to time appear necessary.

Mr. Stephenson contended that the principle involved in the requirement of pharmaceutical qualification was not only right and proper from an abstract point of view, but that it was also of great practical importance on account of the consequences that naturally followed from it and of the results which could only be hoped for by strenuously endeavoring to uphold that principle, and he proceeded to enforce this view of the matter by directing attention to several corollaries inevitably proceeding from the

fundamental proposition as to pharmaceutical qualification. As foremost among these he held that whatever pharmaceutical work was to be done it should be assigned to the pharmacist. He believed that this had been done to a great extent in Scotland, and in Edinburgh especially, much more thoroughly than it had been in the South. In consequence of the differentiation between medical practitioners and pharmacists in that city, the dispensing had for the last forty years been exclusively in the hands of pharmacists; medicine was no longer dispensed by medical practitioners for their patients, as he recollected hearing in the days of his apprenticeship had been formerly the case. Even in public dispensaries, hospitals, etc., the same change had been introduced and dispensing was no longer done supposititiously by the resident surgeon or by medical students, and in reality by a porter. In the public services, also, the principle of requiring qualified dispensers was coming into operation, and the work of compounding medicines was no longer relegated as unskilled labor to quite unqualified men. It was only by the extended application of this principle that it would be possible to do away with practices at variance with the true character of pharmacy, such as guessing quantities instead of weighing, and substituting one thing for another as convenience required, practices which were freely indulged in during the old days he referred to, and were probably not everywhere abandoned at the present time. Another result, considered to be naturally and inevitably deducible from the proposition above stated, was that the executive body of the Society, which was the recognized statutory exponent of British pharmacy, should have a considerable share in the compilation of the book whose very name indicated that it related to the preparation of drugs. The share taken in this work should be by right and not by favor, and whenever the question was opened it could only be settled in one way. The subject, he said, was referred to, not so much for the sake of argument as for the sake of reference to Scottish procedure in past time, when Scotland was under the authority of the Edinburgh Pharmacopœia, as England and Ireland were under those of London and Dublin. In those days, Sir Robert Christison—himself a master in pharmacy, as few medical men are or require to be now—fully recognized the right of pharmacists to take part in the compilation of the national pharmacopœia and he practically gave effect to that recognition by requesting the Scottish members of the Pharmaceutical Society to appoint representatives to sit on the Pharmacopœia Committee of the Medical Council, constituted for the purpose of assisting in the compilation of the British Pharmacopœia. That happened when the Pharmaceutical Society was only *de facto* the exponent of pharmacy, and now that it was *de jure* its exponent, there was still greater reason for the same course being taken consistently with the legitimate claims of pharmacy. A third corollary to be drawn from the proposition above stated had reference to the remuneration of the pharmacist and though he had some delicacy in referring to this point it certainly might be treated as a strictly professional subject. If pharmacy were in any degree a professional pursuit, it should to that extent be remunerated on a professional basis. Intrinsic value was, indeed, a very important factor in the details of a pharmacist's business; but, notwithstanding the dual nature of his calling, intrinsic value was not

the more important factor in the matter, his professional service rendered in dispensing and other parts of his avocation was to be regarded as the true standard of value. It was necessary to consider the qualification of the pharmacist, his competence to verify the purity and potency of every article he deals with, the intelligence and skill implied in this competence, the responsibility involved in the exercise of his functions, a responsibility to be measured by the momentous consequences which might ensue from any inadvertence, not only of himself, but of any agent employed by him, which involved personal attention unknown and uncalled for in any other business, together with the many other qualities, both of head and hand, necessary to constitute a true pharmacist. Considering all these points, the question of intrinsic value sank completely into the shade. The question how to apply the principle of professional remuneration was more difficult. In other professions the range of professional service was more uniform and limited, and the scale of remuneration was consequently more easily understood. In the practice of pharmacy the range of service was wider and multifarious; there might be endless discrepancy of opinions amongst pharmacists themselves as to its value, and the public would still less readily understand paying money and receiving something tangible for it as being a transaction exactly like paying a doctor or a lawyer. The problem was intricate, to be solved only by acting on the principle enunciated and making a fair estimate of the intangible elements in their transactions, namely, the intelligence, skill, responsibility and special knowledge required independently of the value of the materials dealt with. By concerted action on that principle the results would be more satisfactory to pharmacists and not disadvantageous to the public. The practice of working on such a principle had come into operation since the earlier years of his experience; it had its origin in Edinburgh, and, as far as he knew, it had afforded entire satisfaction. The President referred to another matter which he regarded as a legitimate inference to be drawn from his premises, that the qualification of the pharmacist should cover all his dealings with legal poisons, independent of all other restrictive regulations. What more was necessary than the ascertained qualification of those authorized to deal with poisons? Poisoning by inadvertence could never be prevented by Act of Parliament, any more than intentional poisoning. By the qualified pharmacist labeling would be done without the present restrictions; nevertheless these did no actual harm, and he would urge that all poisons, however sold, whether covered with the Government stamp or not, should come under their operation. Still the qualification of the pharmacist was the only real security against preventible poisoning which the Legislature was called upon to take. It had already charged itself with that, and any further legislation on grandmotherly lines would be as much out of place now as the pharmacy of the days of Romeo or the apothecary of Mantua himself would be. Still another inference, drawn from the President's initial proposition, was the need of discountenancing quackery in every shape or form, as the outcome of ignorance, cupidity and credulity. It found a congenial soil on the field of medicine, and especially that part of it occupied by pharmacy; one of its most mischievous results being to give rise to exaggerated notions as to

the true value of remedial agents. Before concluding his address, the President directed the attention of the meeting to some of the alterations and other features of novelty in the British Pharmacopœia just issued.

At the conclusion of the President's address the usual vote of thanks was passed, and the reading of papers was commenced, the first paper taken being a "Report on the Assay of Atropa Belladonna," by Professor Wyndham Dunstan and Mr. Ransom. The second was a report on an allied subject by the same authors. Owing to the nature of the room in which the first meeting was held, the reading of these papers was very imperfectly heard, and what discussion followed took a direction rather different from that in which the authors dealt with the subject. Regret was expressed by the President and others that Professor Dunstan was not present to take part in the discussion and that members of the Conference were thus deprived of the opportunity of congratulating him on his recent appointment. Incidentally the President also remarked that it seemed to be unfortunate that the extract of belladonna leaves had been omitted from the British Pharmacopœia, since the alcoholic extract of the root would not furnish a plaster of the same character as that which had hitherto been used, and Mr. Umney also expressed surprise at the change. Mr. Martindale said he had found a plaster made from extract of the root to meet approval, but that with the green extract he had obtained a dirty discolored plaster. Mr. St. Dalmas suggested that this result might have been due to the use of an extract of German origin. Mr. Borland also disapproved of the omission of the extract of the leaves, inasmuch as the public would still continue to require the "green plaster" to which it had been accustomed.

The next paper was on "Cotton-seed Oil," by Mr. Gilmour, pointing out the possible pharmaceutical applicability of this oil, on account of its cheapness and bland character. The author described several kinds of this oil obtained from different sources. One peculiarity of the oil, mentioned as interesting from a pharmaceutical point of view, was its difficult saponification by lime or ammonia, though when mixed with a small proportion of olive oil it readily formed an emulsion that was permanent.

"Eucalyptus Oil" was the subject of the next paper, by Mr. MacEwan; and the occurrence of several different varieties in commerce was pointed out, with some suggestions as to the sources from which they were derived, and the desirability of further investigation in order to define the character that the oil ought to possess. The paper was opportune, as pointed out by Mr. Umney, since the oil has now been made official, and there is need of its being better known.

In a "Report on Pressed Ergot," read by Mr. Moss, and describing some experiments carried out at the suggestion of Mr. Groves, it was shown that by expressing the fixed oil ergot could be reduced to a cake that was less liable to attacks of insects and alteration by atmospheric influence than ergot in its normal condition. A liquid extract prepared from this pressed ergot had been employed medicinally and found to be as efficacious as that made from ergot in the ordinary way.

Mr. Dott read a series of "Laboratory Notes," pointing out the extreme variability of commercial caustic soda, and the volatility of mercuric chloride and of iodoform; also on berberine sulphate and tests for apomorphine.

Incidentally to the latter subject he pointed out the improbability of the suggestion made by Hager that apomorphine might be formed by keeping for a long time a solution of morphine hydrochlorate.

The next paper, by Mr. Maben, on "Santolina Chamæcyparissus," referred to the use of this herb as an anthelmintic and gave an analysis, which did not, however, throw any light upon its supposed therapeutic efficacy, which in the course of discussion was referred by Mr. MacEwan to theological influences.

In a paper by Mr. Moss on "Natural Camphor Oil," describing his attempts to obtain a further elucidation of the nature of Japan camphor oil, the chief feature was that he did not accept the conclusion arrived at by Mr. MacEwan (see "Amer. Jour. Phar.," 1885, p. 406). Some results were given which tended to show the necessity of a more thorough investigation of the subject. The discussion which followed pointed in the same direction.

"Sublimated Serum and Sublimated Albumen" was the somewhat perverted title of a paper read by Mr. Jones, of Coventry, describing his experiences in the preparation of surgical dressings according to the method suggested by Sir Joseph Lister. This form of surgical dressing does not appear to have been so successful in practice as might have been anticipated, and according to a statement by Mr. Martindale it has been abandoned by Sir Joseph, who is now endeavoring to obtain another means of neutralizing the action of corrosive sublimate as a local irritant without affecting its antiseptic qualities. In the consequent discussion it was suggested by the President that the use of albumen copiously as an antidote in cases of poisoning by corrosive sublimate might be inconsistent with the fact that the coagulated compound of albumen with corrosive sublimate is soluble in excess of albumen. This suggestion, however, indicated a disregard of the direction that the stomach pump should be used immediately after the administration of the antidote. Another paper by the same author described his microscopic observations in reference to a case of cattle poisoning with *Œnanthe crocata*.

Some notes on "Sulphate of Quinine," by Mr. R. H. Davies, described the endeavors he had made to satisfy himself as to the means by which pure sulphate of quinine was to be obtained, and as to the characters that such a salt would possess. It appeared that by recrystallization of commercial sulphate of quinine from water, Mr. Davies failed to obtain a pure salt in less than five operations. But as the character of the material operated upon was unknown, or not stated, no conclusion of any value can be drawn from that experience. Mr. Davies' subsequent endeavors to ascertain by the optical method the nature of the recrystallization products did not furnish him with satisfactory results, but induced him to conclude that the datum given by Dr. Hesse as to the specific rotation of pure sulphate of quinine was incorrect, and that it was probable that what Dr. Hesse has regarded as nearly pure sulphate of quinine really contains about four or five per cent. of cinchonidine sulphate, as stated by De Vrij, Koppeschaar, and others. In the absence of any decisive evidence in contradiction of facts that have long been accepted as well established there was of course

no opportunity for a profitable discussion of the subject brought forward by Mr. Davies.

The time for adjournment having now arrived, the President stated that he had just had placed in his hands, by Dr. Paul, a print of the International Pharmacopœia, which he understood had been adopted by the International Pharmaceutical Congress assembled at Brussels last week, and he called upon Dr. Paul to report what had taken place in regard to it. Dr. Paul then stated that the document he had placed in the President's hands was the result which had been so far obtained in the work undertaken four years ago when the International Pharmaceutical Congress was held in London. On that occasion a Commission consisting of the representatives of various nationalities was appointed and charged with the duty of preparing a draft of an International Pharmacopœia upon the lines that had been agreed to at the Congress. That work had been carried out in the interim by Mr. von Waldheim, President of the Commission, who had by correspondence ascertained the views of other members of the Commission as to the preparations that should be included in an International Pharmacopœia. These views had been embodied in the printed document handed to the President, and at the meeting of the Congress in Brussels last Saturday the adoption of the International Pharmacopœia thus drawn up had been decided upon, a resolution having been adopted that the work should be edited and published as soon as possible. It was not to be supposed that this International Pharmacopœia had any further purpose at present beyond serving as a guide for those who were willing to be guided in the direction of obtaining international uniformity of potent medicinal preparations. It was to be hoped, however, that the opportunity thus afforded would be taken advantage of, and as an indication that this would be done he might mention that Mr. von Waldheim, speaking as the official representative of the Austrian Government, had stated that the Pharmacopœia authorities of that country intended to adopt the decisions arrived at by the Congress, and with that object had in the meantime withheld the new issue of the Austrian Pharmacopœia now under revision. There was, therefore, now a distinct prospect of the work done by the International Congress in London bearing some useful fruit.

The first paper read at the meeting on the following day was on "The Presence of Metallic Impurities in Materials employed for the Manufacture of Aerated Waters," by Mr. W. J. Macadam, showing the presence of lead in sugar, citric acid, tartaric acid, and essence of lemon, and suggesting the desirability of the perfect elimination of such impurity. In the discussion that followed, Mr. Umney, Mr. MacEwan and others deprecated the creation of another scare upon this subject and expressed the opinion that it had been exhausted some years ago, with the result that the quantity of impurity thus likely to be introduced into aerated water would be quite infinitesimal. Mr. Allen, however, on the other hand, considered that the habitual use of water containing a very minute quantity of lead might produce ill effects in certain peculiar constitutions.

Mr. A. H. Jackson next read a paper on "Analyses of Tartar Emetic," giving results which appeared somewhat alarming from the amount of impurity indicated. In the discussion of this paper Mr. Macadam stated

that he had not found tartar emetic adulterated during many years' experience, and Mr. Umney suggested that the samples examined by Mr. Jackson were not real tartar emetic, but a similar preparation lately introduced for use in calico printing, which was in fact a double oxalate of antimony and potash. Mr. Williams gave further information as to the use of this new compound in calico printing, and Mr. Allen was of opinion that a mistake had been made by the author of the paper as to the substance examined.

A paper was then read of Mr. A. H. Allen on "The Alteration of Spirit of Nitrous Ether." This afforded opportunity for exhibiting to the members the very elegant and efficient apparatus devised by Mr. Allen for the estimation of ethyl nitrite, though, in other respects it did not contain, as was pointed out by Mr. MacEwan, much that had not already been published. Another paper by the same author dealt with "The Assay of Amyl Nitrite," and pointed to the probability of the nature of the article met with under this name being of a variable character.

A note by Mr. J. Williams upon the same subject, detailed the results of his experience in the manufacture of amyl nitrite.

In the discussion following the reading of these three papers, Mr. Umney concurred with the opinion that the dilution of sweet spirits of nitre promoted the decomposition of the ethyl nitrite contained in sweet spirit of nitre, and he therefore suggested pharmacists would do well to adopt the gravity of 0·840 for spiritus ætheris nitrosi. The editors of the Pharmacopœia seemed to be disposed to bring the density nearer to that point than it was in the last edition; he was, however, of opinion that starting the distillation with alcohol of sp. gr. 0·838 and nitric and sulphuric acids both containing water, it would be impracticable to obtain a product having that specific gravity.

The paper on "Solution of Ferrous Iodide," by Mr. Robinson, suggested the use of hypophosphorous acid as a means of making this preparation permanent. Some doubts were suggested by Mr. Williams as to the propriety of such a course, but in any case it has been adopted by some manufacturers for several years past.

This paper was the last of those read by the respective authors, and summaries of the succeeding ones were read by the Senior Hon. Gen. Secretary. These were on "The Comparative Strength of Certain Preparations of Ipecacuanha," by Mr. W. A. H. Naylor; "The Quinological Work of the Madras Cinchona Plantations," by Mr. Hooper; "Carmine," by Mr. Dechan; "Ferrum Tartaratum," by Mr. Wright; "Occurrence of Hydrocyanic Acid as a Fermentation Product of Linseed Meal," by Mr. W. F. Senior; "The Determination and Separation of Magnesium and Calcium," by Messrs. A. and L. Siebold; "Insoluble Phosphates," by Mr. Burnett; and "Spurious Cubebs," by Messrs. Elborne and Wilson. It is to be regretted that authors contributing papers to the Conference are not always present to read them, since the discussions to which they might give rise are less likely to be adequately carried out in their absence, and thus a great part of the advantage to be gained from their communications may probably be sacrificed. It might be suggested to the officials of the Conference that they might do well to require the presence of the authors of papers

accepted for reading, or at least of some representative who would act on their behalf.

At the conclusion of the reading of papers the usual votes of thanks were passed, and an invitation conveyed by Mr. Barclay that the Conference should next year meet in Birmingham was accepted by the members, Mr. Umney remarking that after their relaxation in Aberdeen they might appropriately undergo a screwing up in Birmingham. During these proceedings the balloting papers had been distributed, and the Auditors now announced that the list of officers proposed by the Executive had been unanimously adopted, Mr. Thomas Greenish being elected the President for the ensuing year. The following is the complete list:

President.—Thomas Greenish, F.C.S., F.R.M.S., London.

Vice-Presidents.—F. Baden Benger, F.C.S., Manchester; M. Carteighe, F.I.C., F.C.S., London; C. Ekin, F.C.S., London; T. Barclay, Birmingham.

Treasurer—C. Umney, F.I.C., F.C.S., London.

Honorary General Secretaries.—S. Plowman, F.I.C., M.R.C.S., London; J. C. Thresh, D. Sc., F.C.S., Buxton.

Other Members of Executive Committee.—S. R. Atkins, Salisbury; T. Maben, Hawick; J. E. Brunker, M.A., Dublin; W. Hills, F.C.S., London; D. B. Dott, F.R.S.E., Edinburgh; J. P. Kay, Aberdeen; W. A. H. Naylor, F.C.S., London; G. E. Perry, Birmingham; W. H. Symons, F.C.S., F.R.M.S., London.

Local Secretary.—Charles Thompson, Birmingham.

Auditors.—J. Paterson, Aberdeen; C. J. Arblaster, Birmingham.

On Tuesday evening the members of the Conference were entertained at dinner by the Aberdeen and North of Scotland Society of Chemists and Druggists in the Palace Hotel. The proceedings were marked by characteristic Aberdonian conviviality, and were extended to an advanced hour on the following morning. Visits to many of the factories and other industrial establishments in the neighborhood were organized and carried out under the superintendence of various members of the Local Committee during the progress of the meeting. An excursion up the Valley of the Dee had been arranged for Thursday, and the morning being fine a numerous party proceeded by train to Ballater and thence drove past Balmoral to Braemer, where they were hospitably entertained at lunch by the Aberdeen and North of Scotland Chemists and Druggists' Association. The arrangements of this charming excursion were well planned and admirably carried out to the end.—*Phar. Jour. and Trans.*, Sept. 12, 1885.

THE HYPODERMIC ADMINISTRATION OF IODIDE OF SODIUM.—Arcari ("Gazz. Med. Ital. Lombard.") has frequently resorted to this method of administering the iodide in cases of syphilis in which its administration by the mouth was impracticable; if thirty grains are given by the mouth and twenty subcutaneously, the result will be the same as if ninety grains had been given by the mouth. No local disturbances are caused by the injections.—*N. Y. Med. Jour.*, May 9, 1885.

GERMAN APOTHECARIES ASSOCIATION.

The fourteenth meeting was held in Königsberg, the chair being occupied by Dr. Brunnengræber, of Rostock. Addresses of welcome were delivered by Mayor Selke on behalf of the city, and by Mr. Pakheiser on behalf of the local pharmacists. The President's address gave a condensed account of the affairs of the Association and the transactions of its Executive Board; the membership was 2,783, including 15 honorary and 10 associate members; a petition to the different authorities for permitting proprietors, having no qualified assistant, to take one apprentice for instruction had not yet received the attention of all the authorities addressed; the dispensing by homœopaths and the general tariff for the dispensing of medicines had likewise not reached a final settlement; Mr. Schlickum had been elected chairman of the pharmacopœial commission in place of Mr. Vulpius, resigned.

Prof. Dr. Lossen delivered a discourse on the life and labors of Carl W. Scheele.

Several changes in the organization of district societies were readily disposed of, after which a proposition was discussed at considerable length, contemplating the creation of a permanent commission for the purpose of communicating the resolutions of the Society to the Government; of considering the creation of an Advisory Board of Pharmacists and more particularly for elaborating a general uniform regulation for the practice of pharmacy in the German empire. The proposition was not concurred in, the executive board (Vorstand) having full power to carry out these measures.

The proposition of the executive board to establish a pharmaceutical gazette, as the official organ of the Society, was adopted. The "Archiv der Pharmacie," which remains the scientific journal, formerly required an annual contribution of nearly $4,000, but at present yields annually a surplus of somewhat over $500.

The funds in the hands of the Society now amount to 304,753.31 marks (over $73,000). At the preceding annual meeting held in Dresden, the exhibition held under the auspices of the Association had yielded a surplus of 1,083 marks ($260). In the future the Society will pay all legitimate expenses of the annual meetings, but will not be responsible for expenses incurred for the exhibition or for entertainments.

An interesting lecture was delivered by Professor Chun, of Königsberg, on the "Physical Influences of the Sea," and on the "Relations and Dependence of the Animal World on the Conditions of the Sea;" the lecture being based upon the observations made by Prof. Chun at and near Naples during the past ten years.

After the re-election of Dr. Schacht, of Berlin, and Dr. Leube, of Ulm, as members of the Executive Board, various reports were read and disposed of, and the Association adjourned to meet next year in Dusseldorf.

SIXTH INTERNATIONAL PHARMACEUTICAL CONGRESS.

On the afternoon of Monday, August 31st, a *séance solennelle* was held in the Palais des Académies, in Brussels, and the Congress was formally opened by Prince Caraman-Chimay, Minister of Foreign Affairs, acting on behalf of the King of Belgium, in the presence of various representatives of the State and of the city. About twenty countries were represented by delegates. Mr. Van Bastelaer, the President of the Provisional Committee, addressed the Congress, and the Secretary, Mr. Van de Vyvere, after reading the names of honorary officers and honorary members of the Congress, gave an account of the preliminary work accomplished. On motion of Dr. Méhu, of Paris, the Provisional Committee was elected the executive body of the Congress. Vice-Presidents were selected from the different nationalities, Secretaries for the four sections were appointed, and the general regulations for the conduct of business were approved. In the evening an official reception by the municipal authorities at the Hotel de Ville was tendered to the members and their ladies.

Tuesday morning, September 1st, was devoted to work in the sections.

In the first section, Mr. Verhassel presiding, Mr. Berquier reported on *veterinary pharmacy*, and a resolution was adopted declaring that the dispensing of veterinary medicines, for which the most powerful drugs are employed, should be regulated by legislative enactments. Dr. Quinlan read a paper on the necessity for an *International Pharmacopœia* from a medical point of view, which was ordered to be published. Reports on *Pharmaceutical Apprenticeship* were read by Mr. Heger for the Vienna Pharmaceutical Society, and by Mr. Patrouillard, of Gisors. Mr. Bertault discussed the subject of *Assurance Societies* by Pharmacists.

Mr. Cornelis presided over the second section, in which papers were read by Mr. Böttger, of Bunzlau, on the *sale of patent medicines;* by Dr. Méhu on the *solubility of mercuric iodide in fats*, and by Mr. Zanni, of Constantinople, on *pharmaceutical specialties*. This subject created an animated discussion, but its consideration, like that introduced by Mr. Böttger, was finally postponed.

The third section, under the presidency of Mr. Belval, was devoted to sanitary subjects. The danger attending the use of *lead pipes for water supply* introduced by Mr. Hamon, of Boulogne, lead to considerable discussion, involving also the effects of poisonous metals and salts when used for domestic purposes. It was deemed proper that the use of lead pipes should be prohibited, in case the composition of the potable water should be of such a nature as to dissolve lead; and that caution should be exercised in the use of lead-glazed pots, in the cleaning of bottles by means of shot, and in the coloring of articles of food by copper pigments, etc.

In the fourth section, presided over by Van Bastelaer, Mr. Madsen, of Copenhagen, spoke on the restrictions for lessening the evils of the *immoderate use of opium*, contending that the sale of opiates should be restricted to pharmacies, and that prescriptions containing morphine should not be renewed. The subject was postponed for the present, when Mr. Patrouil-

lard discussed the advantages to the pharmacist of making as many as possible of the pharmaceutical preparations and chemicals.

At the first general session, held Tuesday afternoon, Mr. Belval reported on *food adulteration*, and after considerable discussion the following resolutions were adopted:

1. Legislation concerning adulteration should be made the subject of international agreement.

2. A legal definition of adulteration should be established.

3. (*a*) The offence of the adulteration of food or drink should be clearly specified by law. (*b*) The authorities should have the power and means of action for detecting and proving adulterations. (*c*) Adequate means for repressing adulteration should be provided.

4. In each country the health officers should draw up instructions defining the composition of food and drink, and these instructions should form the foundation for an international agreement upon identical data for substances of international interest.

5. The manufacture and commerce of food and drink should be under the supervision of qualified inspectors.

6. A sufficient number of analytical laboratories should be established for the purposes indicated.

7. The central sanitary officers in different countries should keep themselves mutually informed of the results arrived at by the national services of inspection and analysis.

On Tuesday evening the members of the Congress attended a meeting of the Pharmaceutical Society of Brussels, in the University, where they were welcomed by the President, Mr. Créteur, and where a number of honorary and associate members were proclaimed. A concert and conversazione at the Hôtel Mengelle was tendered by the Society on the same evening.

The sessions of the sections were resumed on Wednesday morning, September 2d, the principal interest being centered in the second section and in the discussion on *pharmaceutical specialties*, which had been postponed from the preceding day. A resolution was finally adopted by a large majority of the members present, recommending that the various Governments should be petitioned to take measures for the suppression of all proprietary medicines.

At the second general session, held in the afternoon, the action on the adulteration of food was completed, as reported above, and the subject of *pharmaceutical education* was introduced by a report by Mr. D. Nobele, accompanied by a succinct account of the systems of education in different countries. Professor Dragendorff and Dr. Brunnengräber took part in the discussion, and addressed the Congress in the German language, when it was found that no provision had been made for competent interpreters. The recommendations adopted were as follows:

1. In all countries where it is not already the case a diploma should be established giving the exclusive right to practise pharmacy.

2. Pharmacists should pass through the same preparatory course of study as doctors of medicine and of science.

3. The minimum of knowledge required of pharmacists should be defined.

4. The title of "doctor of pharmacy" should replace other titles now in use.

5. In the absence of the proprietor the business should be conducted by a person possessing the diploma of "candidate" or "assistant."

6. As a subsidiary object, the number of pharmacies should be limited proportional to the population.

In the evening the General Pharmaceutical Association of Belgium entertained the members of the Congress and their ladies by a garden party and concert in the Bois de la Cambre.

On Thursday, September 3, an excursion was had to the city of Ghent, where the Pharmaceutical Association of East Flanders held a meeting and elected a number of honorary members; subsequently different places of interest were visited.

On Friday, September 4, the business of the sections was resumed. In the first section, Mr. Petit presiding, the reports on the regulation of the practice of pharmacy by Mr. Bratimos, and on *pharmaceutical legislation*, made in the name of the Pharmaceutical Society of Athens, were discussed, and a resolution was adopted that the public interests required the limitation of the number of pharmacies. In the third section, Mr. Belval, president, Mr. Van Hamel Roos, of Amsterdam, reported on the *adulteration of food*, and a resolution was carried favoring the publication of an international journal devoted to this subject. Papers on the plastering of wines, on alimentary waters, on the purification of waters by filtration, etc., were read, and the business of the section was closed. The second and fourth sections had combined, Prof. De Nobele, of Ghent, in the chair, discussed the suppression of the trade in *proprietary medicines*, listened to papers by Mr. Limousin and Mr. Lotze, and adopted a resolution offered by Mr. Von Waldheim declaring the pharmacist to be justified in *repeating any prescription* except where the physician has given written directions to the contrary. The sections then closed their sessions.

At the third general session, held in the afternoon of Friday, the Executive Committee of the Congress was charged with the duty of carrying out such measures relating to pharmaceutical education which had been approved by the Congress. The subject of *alimentary waters* was then taken up, and the discussion continued at the fourth general session on Saturday morning, September 5, when the conclusions were adopted formulated by Mr. Van de Vyvere in his lengthy report on "Alimentary waters," to indicate the characters of a potable water. These conclusions are as follows:

1. Potable water should be limpid, transparent, colorless, inodorous and free from suspended matters.

2. It should be cool, of an agreeable taste, its temperature should not vary materially and should not rise above 15° C.

3. It should be aerated, and contain a certain quantity of carbonic acid in solution; the air contained in it should consist of 30 to 33 per cent. of oxygen.

4. It should contain neither animal nor vegetable matters of noisome qualities, and particularly no substances in a state of decomposition.

5. The quantity of organic matter should not exceed 20 Mgm. in the liter, estimated as oxalic acid.

6. The nitrogenated organic matter, boiled with an alkaline solution of potassium permanganate should not yield over 0·1 Mgm. of albuminoid nitrogen per liter.

7. It should not contain over 0·5 Mgm. of ammonia in the liter.

8. One liter of water should not contain over 0·5 Gms. of mineral salts, or 60 Mgm. sulphuric anhydride, 8 Mgm. chlorine, 2 Mgm. nitric anhydride, 200 Mgm. alkaline earths, 30 Mgm. silica and 3 Mgm. iron.

9. Potable water should be free from nitrites, phosphates, sulphuretted hydrogen, sulphides, and from salts of metals precipitable by sulphydric acid or ammonic sulphydrate with the exception of a trace of iron, aluminum or manganese.

10. It should not acquire a disagreeable odor after having been kept in an open or closed vessel.

11. It should dissolve soap without forming grumes, and vegetables (les légumes) should become well cooked in it; its hydrotimetric titre should not exceed 60°.

12. It should not contain saprophytes, leptotrix, leptomites, hypheotrix or other white algæ, nor many infusoria and bacteria.

13. A fungaceous growth should not be developed after the addition of white sugar.

14. In the presence of gelatin, innumerable bacteria should not be produced liquefying the gelatin in less than eight days.

The *International Pharmacopœia* which had been prepared by Mr. Von Waldheim, after conferring with the Commission appointed by the Pharmaceutical Congress in London in 1881, was next taken up for consideration, and the work was approved and ordered to be edited and published as soon as possible, the expenses involved to be born proportionally by the several countries represented on the Commission. In a subsequent number of the JOURNAL we shall give a somewhat detailed account of this work.

The closing session was held in the afternoon when the minutes of the general sessions and of the sections were read, and the city of Milan was selected for holding the seventh International Pharmaceutical Congress in the year 1888.

On Saturday evening a subscription banquet was held in he new Bourse, and on the following day an excursion was had to Antwerp where a reception was tendered to the members by the Pharmaceutical Society of that city, followed by an excursion on the river Scheldt.

CARBOLIZED RESIN FOR INGROWING TOE-NAILS.—Dr. Genese ("Maryland Med. Jour.;" "Therap. Gaz.") recommends this simple method of treatment. Pure carbolic acid and French pine resin are the components of the mixture, of which a single drop is applied to the painful spot; after two or three applications the toe-nail may be raised without pain.